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AMERICAN VETERINARY REVIEW

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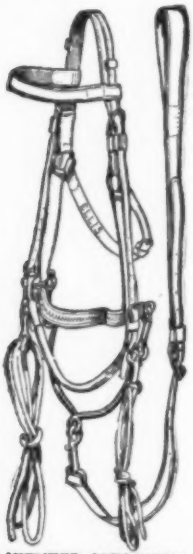

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AMERICAN VETERINARY REVIEW.

NOVEMBER, 1913.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, 15th of September, 1913.

THE DOPING.—I do not know if this subject has received from veterinarians in America the attention that it has created here and that it deserves, and if the improper and fraudulent applications, that is made of it or the general influence that it may have from the point of view of equine stock raising, have been considered. At any rate, this last result of doping has been of sufficient interest to the *Congress Hippique,* which was recently held in Paris, to have it voted that "racing societies should prohibit and forbid doping, which prevents honest sincerity in races, favors frauds, compromises the health of horses as well as breeding interests and also the value and future of equine production."

The learned general inspector of the French veterinary schools, Prof. G. Barrier, was at that congress the promoter of this wish by the reading of a long dissertation on the subject of "Doping." After a few general remarks on the differences that exist between the stimulation obtained by the application of the spur or the use of the whip and that of a syringe of Pravaz or the administration of a bolus, Prof. Barrier passed a review of the various chemical products that will give the required stimulation, and whose administration is readily and easily concealed; and then exposed their after-effects and sequelae. He then fol-

lowed them by the consideration of the injury done to the organism and to the animal individuality.

The length of time during which the condition produced lasted, the peculiar and positive manifestations they gave rise to, their detection in the animal submitted to them, the analytic reaction by which their presence can be made evident in the saliva, by the use of one of the two methods, that of the reaction of Frohde with solution of molybdate of ammonia saturated in pure sulphuric acid or the reaction of Ferreira da Silva by nitric acid and concentrated alcoholic solution of Poash, were all powerfully dealt and presented by Prof. Barrier, whose authority tells of their value.

* * *

At any rate, a long time before the seating of that congress the Secretary of Agriculture had appointed a scientific committee to study doping in its different forms and effects and to settle three essential questions.

1°—DO NORMAL HORSES, VIZ., THOSE WHICH HAVE NOT BEEN DRUGGED AND HAVE RECEIVED THE ORDINARY REGIME OF TRAINING, PRESENT IN THEIR SALIVA, BEFORE OR AFTER A RACE, ALKALOIDS THAT MIGHT BE ATTRIBUTED TO DOPING? The answer was negative. Nine horses having been submitted to the control of this test. No alkaloid being found in their saliva either before or after a race.

2°—DOES THE SALIVA OF AN ANIMAL CONTAIN, FOR A CERTAIN LENGTH OF TIME, TRACES OF ALKALOIDS ADMINISTERED IN THE COURSE OF A TREATMENT OR OF A REGIME ANTERIOR TO A RACE, AND IF SO, DURING WHAT LENGTH OF TIME? The experiments to answer this were carried on at the Alfort school. The horses were submitted to an ordinary regime, and received twice daily, for one week, high doses of alkaloids, strychnia, cocaine, heroine and cafeine. Analysis was made of their saliva after the last administration with the following results: After forty-eight hours nothing was found in any of the horses; after twenty-

four hours nothing was found in the animals that had strychnia, cocaine and heroine. The only saliva of the horse that received large doses of kola, presented the reaction of cafeine, which disappeared a few hours after.

The conclusions of this experiment were: That if an alkaloid is found in the saliva of a horse, the results of this experiment show that this alkaloid has been administered since forty-eight hours at least, and generally at least since twenty-four.

3°—In this question the experiments consisted in the reproduction of a true *doping* in the ordinary condition, viz., to administer the alkaloid stimulant in large doses shortly before the race and watch its elimination through the saliva. The drug was given to the animals used in experiments in bolus or subcutaneous injections. Between a half-hour or an hour after, the horse was run on a track of 3,000 meters, returned to his stall and his saliva collected.

The general result has been that the alkaloids administered were found, if the dose had been sufficiently strong and the saliva collected not too long after the running, the alkaloid remaining in various lengths of time. Cocaine was not found after an hour, heroine after two, strychnia was still found after five, and cafeine for nearly eighteen.

* * *

The committee resumed their conclusions as follows: The results of the experiments plainly prove the method of researches used to expose the practice of doping. This operation which, as it is known, consists in the administration to a horse that is to run in a race, a short time before the race, of alkaloids or of other substances liable to produce them in the organism. It has for its object the giving to the animal an artificial excitement, which supplies him with an advantage over the other horses running with him. The method of researches resorted to, detects the alkaloids in the saliva of a horse that has received the drug and only when it has had it shortly before the race. There is

none to be found if the horse has not had any, or if the doses have been only few and small, or if given a long time before the race. This means of controlling the proof of the *doping* can be depended upon as certain.

These experiments and the conclusions arrived at have already been recognized and admitted in several parts of Europe.

* * *

TRAUMATIC ARTHRITIS—ITS TREATMENT.—Very frequent in horses, where the many violent injuries to which they are exposed, especially in the extremities, explains its presence. Traumatic arthritis may be the result of serious accidents, which can end fatally, if, by proper and early treatment, its dangerous complications are not avoided. It is true that these cases are not all necessarily terminating with such bad results, which either imply a loss of services or perhaps a verdict of death, especially since the days when the therapeutic measures that we possess have rendered complications comparatively exceptional.

To protect, by careful disinfection, an injured articulation, is the first indication. To protect the synovial bursa against the invasion of germs, which may have been deposited, is one of the main objects. The use of tincture of iodine imposes itself, and with it the closing of the wound and the immobilization of the joint are the essential points, recommended in the *Revue Generale* by MM. Lesbre and Ball. If the synovia escapes, still normal and unaltered, a simple twisted suture of the wound is applied, if possible, to the synovial membrane only; especially when it has not been necessary to leave some lacerated or bruised tissues when the cleaning of the trauma was made. The object of this suture is to prevent secondary infections and the introduction of septic elements through the various movements of the animal. To limit those, a stiff blister is also applied. Immobilizing the joint co-operates to the occlusion of the synovial fistula and to some extent increases the asepsy of the lesions by the phagocytosis that it gives rise to. One or several applications of blister

ointment made in succession, and according to the indications, reduce the chances of complications. Wadding dressings will not prove as good as blistering for various causes; doubtful and less realizable asepsy: sometimes difficulty in applying it well, etc., etc.

*
* *

If, notwithstanding those cares, the joint should become infected, and inflammation be declared, or if it exists already, when the synovia is running with a bad aspect or purulent, with all the manifestations of the well-known diseased process, what are the indications?

The ideal would be to evacuate the infected contents of the joint by repeated antiseptic injections. But it is a serious affair with our patients to open freely a joint and realize this evacuation, and it is only in hopeless cases that it is resorted to, at the risk of all the complications that may follow such serious interference.

Antiseptic washings with boiled water, oxygenated water, solutions of hermophenyl at 3 per cent., of permanganate of potassium at 1 to 1,000 may sometimes give good satisfaction.

But to those the authors give the preference to the use of caustic pencils, introduced in the depth of the fistula freely opened. These pencils impregnate the synovial membrane, render the articulation less inhabitable to the invading pyogenous germs. Sublimate and nitrate of silver pencils are common in general practice. But they have some inconveniences. Too caustic, they precipitate albuminoids and organic matters, forming with them compounds, which have no disinfecting power, and coagulums, under which infection keeps on its destroying work. Pencils of boric acid have been recommended, but their antiseptic power is rather limited.

Those of hermophenyl seem to be preferable to all of them. Many cases of arthritis have been treated very successfully by their use. Among those two are mentioned: one of temporo-

maxillary arthritis with bony, necrotic sloughs of the external condyle, and one with arthritis of the tarsal joint. Both of these cases were followed with rapid and complete recovery. Biniodine of mercury in suspension in petroleum oil has also been used with advantage.

In conclusion the authors of the *Revue Generale* say: "Traumatic arthritis is an affection that can most often be avoided at the onset, by treating all the traumatic lesions around the joint. Blistering, suturing of the wound, immobilization are recommended for their real efficacy. When phlegmasia has invaded the joint, the use of pencils that are not toxic or caustic, those that do not precipitate albuminoids, that give the synovial fluid a concentrated antiseptic condition and a continuous and active microbicid action must be the true treatment.

*
* *

ADRENALINE IN VETERINARY MEDICINE.—With the exception of the few cases that I have spoken of in the REVIEW, as they have come under my eyes, I think it is proper to say that its use is more than limited in our medicine, and on that point is far from being employed as often as in human medicine. Indeed, in surgery its indications are quite numerous, and in internal pathology real advantages have been obtained by its uses. Yet we must not think that adrenaline is altogether ignored by veterinarians, as it has been employed to realize a local anemia, either alone or associated with cocaine, novocaine or stovaine, and also in some special affections, such as parturient apoplexy, where doubtful results have been reported; aseptic acute laminitis, anasarca, in which hypodermic injections of isotonic solutions of adrenaline diluted to the 10000th were first experimented with an apparent success, which did not last.

On account of the powerful cardiac tonic action that adrenaline possesses, its use might be suggested with digitalis or camphor, provided it is administered with the greatest prudence, viz., hypodermically, and fractioned in small doses, repeated at close

intervals, so as to realize a progressive action. Hence its indications in cases of insufficiency of the myocardium or in the vasomotor paralysis, such as is observed in the terminal period of some infectious processes, pleuro-pneumonia of horses, septicemia, etc., or again as in human medicine against septic peritonitis.

These remarks of a German veterinarian, Mr. Thum, published in *Monatshefte für Tierheilkunde,* lead to the record of an observation taken from "a cow affected with septic peritonitis due to a volvulus." An explorating capillary puncture having given escape to a fetid, brownish exudate, evident proof of the presence of septic peritonitis, laparotomy was proposed. A rectal examination, previously made, had indicated the position of the volvulus, in the posterior region of the abdomen, near the entrance of the pelvis; the cause of the volvulus was made out by the introduction of the hand in the vagina and through an incision similar to that which is made in ovariotomy, sufficiently enlarged to allow the introduction of the fore-arm. It proved to be a fibrous band, which could be readily torn with the finger. This was followed by the immediate liberation of the strangulated intestine. The exploration of the peritoneal cavity revealed then the presence of a great quantity of inflammatory exudate, which had to be allowed to escape at once, with a large-sized trocar, introduced through the abdominal walls, 20 centimeters from the umbilicus. To allow the drainage of the peritoneum, the canula was left in place and secured on the back of the animal with tapes. Then, with a rubber tube passed in the vaginal wound, the abdominal cavity was washed with 25 litres of tepid isotonic solution of chloride of sodium. After having washed the viscera, this solution escaped through the canula. First it came out cloudy, but became clearer and even limpid towards the end of the operation. The canula was kept closed with cork.

At the same time an hypodermic injection of 5 c.c. of a solution of adrenaline was made on one side of the neck and repeated every 3 hours. The temperature was then 38° C., and pulse 120, scarcely perceptible. On the next day an injection of 12 litres of salt solution was again made, after the removal of 5 litres of

exudate, less fetid than the day before. The temperature was 39.6° C. and pulse 90. No rumination, some appetite. Adrenaline was again administered, five times during the day. The following day there was scarcely any exudate, the canula was taken out, and the internal washing stopped. Temperature 30.3° C., pulse 72, rumination returning, appetite improving, quick recovery.

Thum attributes to the adrenaline the great part of the success and recommends the introduction of this treatment in similar cases amongst ruminants and especially small animals, where septic peritonitis is invariably fatal.

It is certainly a good result that Thum has obtained, and his method is, to say the least, original; but whether or not it will enter in the domain of ordinary practice will remain a question.

* * *

Foot and Mouth Disease in Man.—The question is one of actuality at present, since that scourge is prevailing more or less all over in Europe. Professor Cadiot has recently presented a long paper reviewing the subject before the Academy of Medicine in Paris.

The possibility of the transmission of foot and mouth disease to the human species, which for a long time has been considered as doubtful by the great majority of medical men and veterinarians, is to-day admitted almost by everyone. Notwithstanding some positive experiments and observations, the doctrine generally accepted until 1872 was that of the entire innocuity of the milk of cows affected with foot and mouth disease. In that year the disease prevailed in almost all Europe, and the severity was exceptional. H. Bouley mentioned then the great mortality that it caused among young animals fed with the milk of diseased cows, and he called the attention of physicians to the danger resulting from the use of such milk especially for children.

At that time numerous observations were brought out as proofs of the danger. Cow keepers and farm hands had been

inoculated through wounds of the hands or scratches on the face. A veterinarian (1886) has the disease after examining the mouth of diseased cows. A pig dealer takes it after skinning the cadaver of a calf dead from the disease (1880). Many similar examples are published. In 1887 Dr. David. Director of the School of Dentistry, writes "that the aphthous stomatitis of man and the disease of animals are one and the same disease; the first being transmitted by the second, and it is essential to obtain the interdiction of the sale of milk for human use, when it is coming from cows affected with the scourge, and also the sale of cream or white cheese made with milk from such animals."

Veterinary publications from Germany are numerous and corroborate those made in France. The use of virulent milk, of infected butter, the preparation of animals for sale to butchers, the care to be given to diseased animals are the most ordinary circumstances of contamination either to children or to adults.

In 1890 Bussenius and Siegel collected the facts relating to these questions and related more than fifteen hundred cases of contagion with a few deaths.

In 1893 Shantyr has transmitted foot and mouth disease to two calves on a healthy farm by inoculation with the saliva of a child suffering with typical foot and mouth disease. Bertarelli (1908) has obtained the same result in return to bovines.

Aphtous contagion from animal to man is then positively established. There are several instances published where in man the disease may assume an epidemic form. However, there are few of those where the diagnosis may not have been as positive as it might.

In 1902 the Academy of Medicine has expressed the wish that "sanitary regulations ought not to allow the sale of milk from cows affected with foot and mouth disease, unless such milk be boiled or pasteurized at 85 degrees."

Sterilization or heating at 90 degrees during quarter of an hour are measures applied to-day in most foreign countries; and that is as much to prevent contamination to man as to avoid all risk of extension of the disease by the milk or its derived products.

At any rate, these measures are always excellent hygiene. Imposed for children, they are recommended even for adults. Notwithstanding its white color and because of the conditions where it is gathered, milk is an unclean food, soiled at the time it is collected, soiled again by the manipulations it has to go through. Regulations, if properly applied, may reduce the soiling causes, but milk will not be purified, except by boiling or long heating, for several minutes, at the temperature close to 100 degrees.

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* *

Coloring Microbes.—Many are the means of coloration resorted to in laboratories for the detection of microbes. But the methods used are more or less delicate or complicated, and a general, simple and quick microscopic technic of easy application would be of great advantage.

In the *Annales de Belgique*, Mr. P. Vander Elst calls attention to the mode of coloration realized by the use of Indian ink by Prof. Burri, of Bern, which makes it possible to obtain, so to speak, a *negative* coloration of the germs. With the other methods the microbe is colored; with Burri's, it remains clear, refringent on the black surface formed by the ink.

Upon a thin glass slide is placed a small drop of ink with an equal quantity of distilled water. To these is added as much as the head of a pin of the substance to be examined (blood, pus, any discharge, culture), etc. The whole is mixed on the slide and frottis are made, one or more if the quantity of the mixture allows it. The slide is left to dry, to the air or the alcohol lamp, When the preparation is dry, a drop of balsam is put on it. It is covered with thin lamella and is ready to be examined. It is necessary to avoid the use of too thick a quantity of ink, and that it should not exceed much the thickness of the microbe (?), hence the indication that the frottis be very thin. If the preparation, when examined, is black, it is because the ink is too thick. If the frotti is of a clear brown, the microscopic field shall not be

dark enough to show the refrigerency of the germs, which on a dark brown surface is shown very clear, the microbe is readily exposed in such a way that the bacteria of anthrax can be recognized with a magnifying power of 80 diameters. Fresh material is not necessary for making the frottis, and the preservation of virulent products in diluted antiseptic solutions does not prevent the clearness of the exhibition of the microbe.

A number of micro-photographs illustrates the application of the method made by Mr. Vander Elst, viz., piogenous staphylococci of mammitis in cows, tetragens from a nasal discharge on various cultures, ovoid bacterias of pasteurellosis, bacteridian anthrax, spirillium dentum found in dental caries of horses.

The method of Prof. Burri permits a rapid diagnosis that may render great services and cannot be ignored.

* * *

Bibliographic Items.—Reprints of the Studies of the Research Laboratory of Parke, Davis and Co. No. 31—*Studies on Hog Cholera*, by Walter E. King and Robert H. Wilson. Nos. 32 and 38—*The Virus of Hog Cholera*, by the same, F. W. Beslack and George L. Hoffman. No. 39—*Bacillus Bronchisepticus, Its Relation to Canine Distemper*, by N. S. Ferry, M.D.

Bureau of Animal Industry: Bulletin 161—*A Study of the Bacteria Which Survive Pasteurization*, by Henry Ayers and William E. Johnson, Jr. Bulletin 163—*The Life History of Habronema Muscae* (Carter), a Parasite of the Horse Transmitted by the House Fly, by B. H. Ramson, Ph.D.

Agricultural Journal of the Union of South Africa, June. "The Problem of Bovine Pest in Camels (Una questione molto sena di prophilaxy)," by Dr. Giulio Conti.

The West Australian, with the news of the appointment of Dr. E. A. Weston, G.M.V.C., B.V.Sc., as lecturer on veterinary science to the University of Western Australia. Graduate of the Melbourne Veterinary College and of the Dookie Agricultural College of Victoria. The doctor has already contributed much in his native land to the elevation of his profession.

TEAM WORK FOR VETERINARY LEGISLATION.

Beyond the first fifty years of the American Veterinary Medical Association, which is the mother organization of the American veterinary profession, what then? Dr. Mohler, in his presidential address in New York, at the golden jubilee, praised the "team work" of the legislative committee. By that he meant, palpably, the concurrent activities of the men composing that committee, under the chairman, for the advantage of the army veterinary service bill in the 62d Congress and the present one and the marvelous receptiveness of the profession to appeals in behalf of the bill, which, to use a football phrase in this, the football season, brought it as a team in massed play upon Congress sufficient, one would have thought, to pass the bill. Fifty years have gone by. The golden jubilee of the A. V. M. A. is over. Where is the army veterinary service?—fifty, nay, one hundred and fifty years behind the times; and it will remain there if we do not, by harder training and still better team work, carry the Hay bill (H. R. 4541) through Congress this winter.

There are three words in which are compressed the increments of success in this undertaking—organization, education, agitation.

Before a bill of this character can get through Congress there must be organization of all the elements which desire its passage and a union of all in the work of impressing Congress with its necessity. The bill goes before the national legislature for its enactment into law, as a demand of the profession and all the associated businesses, trades and professions with which it is interlocked. The veterinary profession, separate and alone, cannot pass this bill; the thousands of voters, of which it is composed, are not enough in themselves, unaccompanied, to get such a hold upon Congress as will force the passage of the bill. But when there are associated with us in this undertaking our allies in the businesses, trades and professions with whom we are associated, all are together a host to which Congress must listen. The militia of the states, the humane societies, the national breeding

associations—Morgan horse association and thoroughbred associations—interested in the improvement of the army horse, book, drug and instrument men, are illustrations of allied interests, the influence of whom is to be sought for the purpose. An analysis of our connections in professional life shows that our alliances are naturally in many directions, each having its organized power and at the same time its political strength. They are dependent in part upon us and we on them when political work is to be done. The organized veterinary body—national, state, city, institutional, fraternal—is great in itself politically; but greater when it gathers with it the host of voters among its allies to do the work of forcing the passage of the bill. Organization means the unionizing of all for the single purpose. Team work for veterinary legislation of this kind must mass all together and cause them to move upon Congress demanding attention.

But this organized power—the profession and its multitudinous allies—must be leavened by education into an understanding of the essential value of reform of the army veterinary service which is demanded. The bill is to be seen as valuable to us all. The profession as a whole is to profit by its passage, and this thought is working its way into the veterinary mind in a most gratifying way. We, as a profession, have made our mark in the United States Department of Agriculture; why should we not do the same, or something like it, in the Department of War? Why should the veterinarian be made fowl in one and fish in the other? If, when justice is done him in one department, he can rise to such distinction as he has done in the Bureau of Animal Industry and be applauded the nation over for his work, why should he not amount to something in the War Department if justice is done him there? Every member of the profession should be made to see the absurdity of the situation. Our friends and the friends of our friends must be taught these things.

Nor is this all. Knowledge of this matter is not sufficient. The intellect of man is notoriously cold as the ice-brook. The hearts of men must be won that they may feel the truth and earnestly seek the justice needed. The darkey preacher hit the

mark when he told of the cause of his success with his flock. "Yessir," he said, "I 'splains, then I 'splains; I 'spounds and 'spounds; then I puts in the 'rousal" (explains and expounds and then puts in the arousal). This plan is the precursor of success in the passage of the army veterinary service bill. The profession, the public with which it is connected, Congress, must have its necessity, its justice, endlessly explained until aroused to the final activity which brings its passage. G. S.

NEW ORLEANS IN 1914.

In both its September and October issues, the REVIEW expressed it as its belief that the 1914 meeting of the American Veterinary Medical Association would be held in New Orleans; and we are now in a position by the authority of President Marshall, to officially announce that the 51st annual convention of the A. V. M. A. will be held in New Orleans, December 28 to 31, 1914. That is surely a pleasant anticipation; for, aside from the good that the national organization will do for the cause of veterinary science by meeting in that part of our great country, as has been expressed by some of the most prominent members of the profession from the South, and the good that that section will do to the association and its members by having them there, there is the inspiring prospect of a week spent in that thriving metropolis of the South, which is distinctly one of the quaintest, most picturesque and cosmopolitan cities of America, embracing strong attributes of both the old and the new world. Many members of the American Veterinary Medical Association who were in attendance at the recent meeting in New York will remember Mayor Behrman's fascinating description of the city, in which he explained that Canal Street, which is 182 feet wide, separates the American from the old French quarter. The south, or upper side, is the American portion, and here are situated the big jobbing and business houses, hotels and restaurants, and boarding-houses of American type. The farther up

one goes the prettier this portion of the city becomes, finally beginning the beautiful "Garden District" with palatial and stately homes, exquisitely kept lawns and great groves of magnolia and oak. Below Canal Street is the French or Latin Quarter, where Creole business houses and homes hold almost undisputed sway. The restaurants of the French Quarter are famed for their delicious dishes and unexcelled cuisine the world over. And so we might go on and speak of the cathedrals, churches, theatres, hotels, etc., of this quaintly beautiful and picturesque city—a combination of Spain and Southern France dropped within our gates—but space being somewhat limited in this number, and considerable time intervening between the present and the time when our readers will be headed toward the Gulf of Mexico, this will suffice as an introduction.

Report of the Special Committee for the Detection of Glanders.—In this age of preventive medicine and campaign for the control of contagious diseases, there is probably no more important issue than the war against glanders in horses, so prevalent in the large cities. In our October issue we gave the personnel of the above committee on page 16; we also published on page 72 of that issue, a resume on the control and eradication of glanders presented to the American Veterinary Medical Association at the request of the "Special Committee." Having read that resume in the October number, our readers will be pleased to know that the more detailed report of the *Special Committee for the Detection of Glanders* will be found on page 218 of the present issue.

Army Veterinary Service Legislation.—President Marshall of the American Veterinary Medical Association has exemplified his wisdom by reappointing Dr. W. Horace Hoskins chairman of the Legislative Committee of the A. V. M. A., and Chairman Hoskins has plunged into the work before the Sixty-third Congress with the same earnest determination that has characterized his former legislative work; and if the profession responds as it should, and undoubtedly will, to his appeal sent out under date of September 11th, House Bill No. 4541 will be successfully passed by Congress.

ORIGINAL ARTICLES.

THE SURGICAL TREATMENT OF COLICS IN ANIMALS.*

By L. A. Merillat, Chicago, Ill.

(*Continued from October issue.*)

Impaction of the Rumen: Impaction of the rumen is also a very common disorder in which surgery plays the most important role. It occurs both as a primary and a secondary affection. This form of stomach colic in its more formidable forms, yield only to surgical teatment. Medicants are often useless. It is cured either by rumenotomy, which will be described by Dr. W. J. Martin, or else by the procedure of Imminger, which consists of the installation of water directly into the rumen through a canula and then aspirating out the softened contents by placing the animal on its left side with the canula still in place. The patient is placed on an elevated platform made of two planks separated from each other just far enough so that the protruding canula will pass between them. It reminds one of emptying a barrel through a bunghole. The liquid which runs out carries with it considerable of the solids, and besides, robs the rumen of harmful toxic products besides softening the mass better to facilitate its onward passage through the alimentary canal. The possibilities of this operation have never been tried out to any great extent in this country, but it seems to me to be destined to become a standard operation. The softening of the contents of impacted rumens by instilling water through a canula is not new, but the washing out process of Imminger is, I believe, an innovation.

Foreign Bodies in the Stomach of Dogs: Dogs and cats,

* Presented to the fiftieth anniversary meeting of the American Veterinary Medical Association at New York, September, 1913.

but particularly the former, often swallow indigestible objects that lodge in the stomach. Sometimes they obstruct the pylorus or if small enough may pass into the intestinal tract.

While such objects sojourn in the stomach, the usual signs of colic presented by dogs are wanting, but when they obstruct the pylorus or any part of the intestines, the restlessness, howling, whining, vomiting and bulging of the abdomen indicate that a prompt intervention for removal is demanded to prevent a fatal termination.

When such obstructions are known to exist and expulsion by other means is futile, few veterinarians hesitate to effect a removal by means of a direct celio-gastrotomy. Many of these operations have been performed and nearly all of them have been successful. We have done three such operations upon dogs and all recovered. One swallowed a molar tooth of a horse, one a hairpin and the other a silver dollar.

Foreign Bodies in the Rumen: Bovines are the ruminants most liable to swallow bodies, and that they do so with remarkable frequency is well known to all rural practitioners. The rapid ingestion of their food and the liability of their rations to contain foreign objects makes the bovine species most susceptible to this accident. Nails, pieces of wire, splinters of wood, knives, screws, bolts, nuts and in fact any of the small free objects found about stables which may accidentally get into the feed box or the manger constitute so many varieties of objects found in the rumen. Geo. B. Jones found a cow's rumen that contained a large quantity of binder twine and from time to time we hear reports of various miscellaneous objects gaining access to it. The objects may sojourn in the rumen for months without causing any disturbance that announces their presence, but not infrequently digestive disorders are produced by them, sometimes in the form of acute colic. More often, however, when they wound the wall of the rumen or reticulum they produce a local inflammation that spreads over the peritoneum very rapidly, and by perforating the diaphragm they sometimes cause thoracic inflammations, particularly of the pericardium. There is unfortunately no pathognomonic symptom at

an early stage upon which a diagnosis could be based, and on this account the surgeon seldom operates for their removal until it is too late.

Here again we have a serious condition that calls for a more careful study of symptoms in order that we may be able to diagnose the trouble at a time when surgical intervention could be depended upon to effect a prompt relief.

Impaction of the Crop of Fowls: The crop of fowls is very frequently overloaded to a serious extent, and is usualy due to overfeeding of the young. The impaction may be of corn, oats, gravel, weed-seeds, peas or any of the small grains that constitute the feeds of these animals. Eaten dry, such grains may swell from their contact with the moisture of the crop and engorge it to a dangerous proportion. Young ducks are probably the most susceptible to this disorder. Whole flocks of young ducks may die over night after having partaken too freely of almost any kind of dry grains. I have found among my own animals that ducks are most difficult to raise successfully unless especial precautions are constantly taken to prevent this occurrence while they are young. The symptoms are bulging of the breast, difficulty of locomotion from the sheer weight of the mass which causes them to tumble forward and then on their sides. If not relieved, often they are unable to gain the upright position, and then die in a few hours from exhaustion. In older animals the disorder takes a less acute form. Chickens may live several days, dying from the inflammatory complications which supervene. The contents decompose and soon there is pressure gangrene of the walls.

In young ducks the crop may be evacuated by pressing out the contents in the forward direction, that is, the contents are pressed out through the mouth. Dr. F. H. Davis, a veterinarian of wide experience with ducks, once saved the majority of a large flock of young ducks that became stricken with this condition after having been given access to a lot of windfall berries that had been blown down from a mulberry tree. The flock was found in a serious condition almost immediately after having eaten the berries, and by promptly pressing the contents out through the

mouth he succeeded in saving the flock from being wiped out. Personally, I have had a similar experience with a flock of nine ducks that fell sick after having ravenously devoured a dry mash of corn and wheat bran.

In the older fowls, particularly chickens that have suffered for some hours, it is not possible to effect an evacuation by this means, but by performing simple section of the pouch (ingluviotomy) the patients can be saved when the walls have not been too badly damaged by complications.

These operations are not trivialities by any means, and deserve to be placed amongst our standard surgical procedures.

The Small Intestines: The small intestines are subject to very grave conditions which cause colics, and pain located in them is the most violent of all abdominal pains, and the more anterior the trouble is located the more intense is the pain. A diagnosis of colic in the small intestines is made by the intense agony the patient suffers and continues to suffer throughout. Whenever a horse throws itself about recklessly and violently and is beyond control, often falling to the floor with the full weight of the body, time after time without a moment of relief, except possibly when it rolls into dorsal condition against the wall, it is pretty safe to diagnose colic in the small intestines, and the antero-posterior location may be judged by the intensity of the pains. The duodenum and jejunum cause a more intense pain than the ileum, other things being equal.

The small intestines, especially of large animals, are not affected with conditions that can be successfully managed by surgery, and they are only mentioned here to carry out our plan of differentiating colicky pains. Our loss, however, in this connection is not great, and should not be discouraging, because bowel surgery for intrinsic conditions are pretty hopeless anywhere. Even the human surgeon despairs at the necessity of cutting into the intestinal tract, and if we are denied the benefit of such interventions, we are not denied much that is successful. I know that surgical literature records enterotomies, enterectomies and approximations with a recklessness that would lead a reader

to believe that these are but commonplace, every day trivialities, but when one scans statistics of mortalities and untoward sequelae we veterinarians may be thankful that our animal patients are not suitable subjects for such operations.

The diseases of the small intestines found in domestic animals with sufficient frequency to be called common diseases are: 1st. *Enteritis:* Enteritis may be local, from a local obstruction, but more often it affects a more extensive area. The whole tract, including the stomach and large intestines may be affected. It probably always has its origin in faulty alimentation, but early in the course of the pain bacteria play an important role and thus produce a condition that no surgical operation could benefit. 2d. *Obstruction.* Obstruction from fibrous forage or unnatural food may cause obstruction at one point or over a considerable portion of the small bowels. Circumscribed obstructions may cause pouching of the gut at the point affected and thus leave a place for future accumulations. In dogs clay, sand, or foreign bodies may lodge in them, and in rumenants foreign bodies may pass the four stomachs and lodge at or behind the pylorus. Here again we cannot successfully operate for them even if we should eventually succeed in diagnosing these cases. 3d. *Volvulus and Invaginations* are common enough to warrant a very close study of the early symptoms. And it is a pity we do not diagnose them early because here we have conditions which could be relieved by extrinsic manipulations and would, therefore, be less hazardous than operation requiring invasion of the rumen. I regret to say that I have never been able to find these conditions except at the postmortem examination.

The Large Intestines: Pain in the large bowels is easy to differentiate from pain in the stomach or small intestines. It is always of a milder type and often intermittent. May last for days. In practically all of the autopsies I have had the opportunity to hold on animals dead after long sieges of colic, the incriminating lesion was found in the large bowel. The pain may be acute in the early stage, but this soon gives way to one that is milder and lasting. Sitting upon the haunches, dog-like, points

to trouble in the large bowel. The common sign of turning the nose toward the flank is also one that is seen more often in disorders of the large bowels than of the small ones, although too much dependence must not be placed upon this symptom, because the same manifestation is seen in almost any form of colic. The act of holding the nose at the flank for some moments at the time is, however, a certain indication of a grave condition, like strangulated hernia, volvulus, invagination or fatal local obstruction of some other character. In stomach colics there is always the telltale dilatation of the nostrils and local sweating about the foreparts of the body, while in colon disorders these symptoms are wanting after the bloating has been relieved. These rules of course apply only to the early stages of the affection. An impaction at the sternal flexure may give rise to these stomach symptoms, but the differentiation is soon made when stomach catheterization fails to afford relief, and then there is always the rectal exploration upon which we can depend to make an accurate diagnosis of the exact seat of the obstructions in all instances.

The disorders of the large bowels in which surgery play an important role are: 1st. *Acute Intestinal Indigestion.* This is sometimes, although by no means always, associated with acute indigestion in the stomach. In this condition, the flatulent colic of the old school veterinarians, the bowels are overwhelmed with food or with tainted food. The formation of gases from fermentation is sometimes so rapid as to cause death in short order if relief is not promptly given, and often the damage done to the intestinal walls by the stretching produces a condition in the colon analogous to the dilatation of the stomach previously described. The exhaustive muscularis being unable to contract fails to move the accumulated mass. Very often, I regret to say, this state of exhaustion is aggravated if not actually caused by the administration of eserine or arecoline. These drugs tax the muscularis severely by causing futile contractions against the solid contents, and thus leave the bowels helpless, vapid, paralyzed at a crucial period of the disease when a little peristalsis would be mighty precious.

Treatment: The simple operation of intestinal puncture, entercentesis, as we have been prone to call it, is the cherished bit of colic surgery that must be depended upon as the curative expedient. It is strictly a veterinarian's operation, very old and very simple, but no less the valuable because of this. The value of horses saved by this simple operation would be well worth recording. When this operation has been done appropriate medical treatment per os must follow. *Analgesics?* No. Cannabis Indica, chloral, opiates are so many harmful agents that should have no place in the treatment of this condition, or in fact any form of colic for that matter. I have, during the last few years, followed with wonderful success the treatment of the late Dr. N. P. Whitmore, of Illinois, which consists of the administration of ether in large doses. Whitmore would administer to his patients sick with acute indigestion, gastric or intestinal, a full half pint of ether as a drench. I have been told on good authority that he sometimes drenched a horse with one-half pint and even a full pint of ether from the original package without dilution. This we have modified to 6 ounces, given with linseed oil. The effect of ether vapor upon intestinal fermentation is phenomenal when given in large doses. A purgative of aloin or aloes given as soon as the acute symptoms have passed will act as a stimulant to the colon some hours later, at a time such stimulation is needed to prevent obstipation.

The second disorder of the large bowels is impaction of the colon—a condition consisting of the accumulation of more or less solid masses of aliment throughout or at different points of this large folded compartment. It may follow acute intestinal indigestion or may arrive as an initial condition. Where horses are fed largely upon dry fodder for months, it is very common, and horses worked hard and fed well to keep up their condition are also very susceptible. In hard worked city horses it often follows periods of idleness where the ration is not reduced, and horses idle from some locomotory disability may fall victims while unable to take sufficient exercise to keep up the intestinal activity.

Pathologically, impaction of the colon as seen in horses is a partial or complete paralysis of the walls of the colon. The word "paralysis" applies best to this condition because the muscularis after being overwhelmed into a state of enfeeblement fails to contract.

The symptoms are quite characteristic. Indeed, there is little excuse for not making an early diagnosis in every case. The pain is mild and at first intermittent. The right flank compared carefully with the left is slightly bulged and sometimes bloated. During the first hour or two feces are voided frequently in small quantities, but this ceases as soon as the floating colon is empty. On auscultation of the right flank the borborygmus is found feeble or absent, and on exploration per rectum there is little trouble found in locating the solid contents of the colon. When the pain is more acute the patient may sit, dog-fashion, or at times stretch out as a male does in the act of urination. The absorption of toxic products may cause some elevation of temperature in rare cases early in the course of the disease, but more often there is but little rise in the body temperature until the patient is in a hopeless condition. I would always interpret fever with colonic impactions as an exceedingly grave symptom.

Treatment: When impaction of the colon is found to exist, no time must be lost in waiting for the action of slow acting purges, and powerful drugs acting in transient stimulants to the muscularis are exceedingly harmful. A horse affected with a formidable impaction of the colon that survives a dose of eserine, survives in spite of the treatment and not through it. Linseed oil and also aloes are probably the best drugs for this condition, but are useless in serious cases because there are no contractions of the muscularis to distribute it to and through the accumulated mass, and as for eserine I am certain it is only helpful in cases which would have recovered without medication. The walls are too weak to cope with the heavy, dry, voluminous mass impacted within them and a transient stimulation such as is produced by eserine only adds to the enfeeblement, by impelling futile contractions.

We are now using for this condition three forms of direct treatment: 1st. *Colonic flushings per rectum—high enemas.* While we have not entirely overcome the difficulties attending attempts to wash out the large colon of horses, we are becoming more and more successful in injecting large volumes of water into it. We admit there is no easy method of washing out the colon. The long floating colon of the herbivorous animals stand as a real obstacle against the instillation of water into the larger compartment anterior to it, but since the veterinarian is thus deprived of a mighty effectual curative experiment, any manipulation that would surmount this obstacle would be an invaluable addition to the treatment of many grave disorders. We need colonic flushing in animal therapy and we need it badly. Fatalities among animals sick with digestive disorders would be greatly reduced if we could inject water into the colon of herbivora as easily as in that of the carnivora and of humans. Curing impactions of the colon would then be a triviality.

Our method of forcing water into the colon is not perfect. We are still in need of a better instrument to prevent reflex from straining, but we have shown to our entire satisfaction that by patiently forcing water at a temperature of 112 Fahr. into the floating colon by means of a hose and pump with the rectum packed with substances to prevent free reflex of the water, large quantities can be passed into the colon. While the floating colon is still full of feces not much headway can be made, but when these are expelled, a stream may be made to flow forward through this gut into the large colon. Straining to expel the water injected cannot be entirely controlled, but we have found that since all of the water injected is not successfully expelled by the patient in these seizures, some will find its way into the colon if the operation is persistently continued. We have found also that an animal narcotized with drugs administered hypodermically or anaesthetized with chloroform will take large volumes of water by a little patient forcing, and also that water at the proper temperature (not too hot nor not too cold) is less apt to cause straining. We once ruptured a horse's floating colon by

applying too much force to the pump, which fact shows the operation is not without its hazard.

Our method in use to-day, but which we hope to improve when we have finally invented the proper instrument, is as follows: A hose is passed into the floating colon as far as possible and then the rectum is packed with cotton wads until it is full. Expulsion of the cotton is prevented by holding the hand firmly against it within the anus. Then hot water previously prepared in abundance is pumped into the hose until straining is produced. As soon as the straining paroxysm ceases, the pumping is resumed. At first, only a small quantity may be retained, but if the operation is persistently repeated, large quantities will eventually find its way forward. The operation is a mussy affair, I admit, but it is no less valuable on this account. The Kellogg syringe, which contains an inflatable rubber bulb to prevent reflux is probably an improvement over this more crude mechanism of ours, but it too must be held in with the hands and the reflux is by no means controlled by it. There is need of a hose having an inflatable bulb as large as a football that is so arranged that it can be retained in the rectum by means of a harness. We are now having such an affair constructed, but since it has never been completed, we cannot of course venture any opinion as to its merits at this time.

Instillation of Water into the Stomach: The second operation we use against impactions of the colon is the instillation of copious drafts of water into the intestines through the stomach with the stomach tube. If the stomach is full, but this is seldom the case, it should first be washed out and then 6 to 8 gallons of water injected into it. The water promptly finds its way into the intestinal tract, sometimes as far as the caecum. By supplying the intestines with these liberal draughts of water from two directions, there are indeed few cases of impactions that will not yield when the diagnosis is made before the muscularis has been too seriously weakened and a peritonitis has already developed.

Flushing the Colon Through the Abdominal Wall: The

third is the direct instillation of water or oil into the colon through the abdominal wall by means of a trocar or canula. The right flank is punctured in the usual manner and after the trocar is removed, a small rubber hose is attached to the canula and the instillation done by pouring the liquid into a funnel attached to the other end. The intestines will slowly take liberal amounts of fluids in this manner. The procedure is harmless and if done at an early stage, is very effectual.

When the contents are known to have been softened by these methods, eserine may be given with safety and with splendid results.

I am aware these symptoms of attacking impactions are not new. They have, however, never become standard operations, and in view of the fact that they are proving phenomenal in the hands of those who have become expert in the essential manipulations, this attention to them has been deemed worth while.

Torsion of the Colon: Torsion of the colon is a common enough accident in horses, and of course always fatal. Attempts to correct this misplacement by manipulations have never been successful. Some have told that this may be done by rolling the patient while the arm is held in the rectum. At my hands this has always failed. Direct handling of the organ through a flank laparotomy has likewise been an unsucceessful procedure with me. I have always found the colon too weak to stand the traction required to lift it with its heavy contents. Latterly the procedure of Hartwig, of Wisconsin, for torsion of the uterus of cows has occurred to me to be applicable to the colon as well. I have, unfortunately, not met a case since Hartwig announced his method publicly, but believe we now have a method of untwisting a colon without much trouble. The success of course will depend upon a diagnosis made before the organ is damaged by disease.

Hartwig has performed some operations for torsion of the uterus in cows with splendid success by making an abdominal section in the right flank large enough to admit both arms. In this I see the secret of success in handling the twisted colon, for with both hands the organ can be lifted without danger of tearing its walls.

In conclusion, I venture to say that the possibilities of successful instrumentation of the intestinal tract and stomach of animals are by no means meagre. Although the operations are of a different order than those splendid invasions of the human surgeons, we have a broad field which we have thus far failed to cultivate as fruitfully as is possible, and from which may be selected a wealth of operations that cure colics heretofore regarded as fatal.

PHYSICIANS PAY TRIBUTE TO VETERINARY SCIENCE.—In an article in *The American Journal of Clinical Medicine* for September, on page 773, entitled "Help to Make Smooth the Road to Motherhood," Dr. E. B. Young, of Baker, La., says, "I will say that the source from which I probably have received the most information outside of my own profession has been the veterinarian. He then states that it has been his good fortune to have a close personal acquaintance with three first-class veterinarians, "one of whom," he goes on to say, "has an international reputation, and than whom there is no better. I speak of W. H. Dalrymple, M. R. C. V. S., professor of veterinary science at the Louisiana State University. I never met any of these gentlemen without adding something to my store of useful practical information." Another recognition of the benefit of co-operative study between the physician and the veterinarian is made manifest in an article entitled "Oxygen Subcutaneously" under the head of "Correspondence," by Dr. J. A. Burnett. Read it, and give Dr. Burnett the benefit of your experience through the columns of the REVIEW.

NATIONAL ASSOCIATION BUREAU OF ANIMAL INDUSTRY EMPLOYEES.—Through the courtesy of Dr. S. J. Walkley, secretary of the above association, we recently received a copy of the proceedings of the first annual meeting at Chicago in May last. It was a three day meeting, with evening sessions, and an immense amount of work was accomplished. The REVIEW commended the organization of this association at the time of its inception, and predicted a great future for it, which has already been realized, although it is still young. We note, in reading the proceedings, that the Chief of B. A. I. is also much impressed with the work of the organization, and regret that they were not received in time to abstract more fully from them.

ADDRESS BY PROF. WILLIAM A. EVANS, CHICAGO, ILL.*

Mr. Chairman, Ladies and Gentlemen: About two years ago the New York Milk Committee recognizing the chaos that prevailed in the milk business, and recognizing that one of the reasons for this chaos was a lack of standards, decided that they would appoint a Milk Standards Commission, this commission to be composed of men who had had experience with milk in different ways, in order that each might bring to the work of the commission his point of view, and with the idea that that presentation would be of service in arriving at conclusions. The idea was that, this report having been made, ordinances and laws would be adopted, drawn along the general lines of the report, and that if then it should be found that there were features of the report that did not work well, modification would ensue. It was not thought that one general statute, or one general ordinance, could be drawn applicable to all parts of the country, since that which has made the milk question difficult to handle has been the fact that it does not enter into general commerce; the reason being that there is so much of variation between the different communities and so many things that make it impossible for the supply of one community to be available to any large extent for any other community; or, in other words, one of the factors that has worked against getting milk on the same commercial basis that other commodities are on is the fact that milk conditions are flavored or tinctured by local conditions. Nevertheless it was thought that gain would be had if there could be a uniform thread, a certain thread of uniformity, on which variation would be made to suit the peculiarities of different communities. This was as much as the New York Milk Committee had in mind in the selection of this Milk Standards Commission.

*An extemporaneous address delivered before the American Veterinary Medical Association on the morning of the last day's session at New York, September, 1913.

Some two hundred names were submitted for membership on the commission, and out of that number approximately twenty were selected, most of whom have remained with the commission during its two years of existence. The membership commission, as at present constituted, is composed of Dr. B. L. Arms, who at that time was an assistant in the department of biology and public health of the Massachusetts Institute of Technology, director of the laboratories of the Health Department of Boston, now director of the laboratories of the Health Department of the State of Oregon; Dr. John F. Anderson, director of the Hygienic Laboratory of the United States Public Health Service, Washington, D. C.; Prof. H. W. Conn, director of the Bacteriological Laboratory of the Connecticut State Board of Health; Prof. Conn, of Wesleyan University; Dr. E. C. Levy, Health Officer of Richmond, Va.; Dr. A. D. Melvin, Chief of the Bureau of Animal Industry of the Department of Agriculture; Dr. Wm. H. Park, Director of Laboratories, Department of Health of the City of New York; Mr. Raymond A. Pearson, President of the State College of Agriculture of Ames, Iowa; Dr. M. P. Ravenel, Director of the Hygienic Laboratory of the University of Wisconsin; Prof. M. J. Rosenau, Professor of Hygiene and Preventive Medicine, Harvard Medical School; Mr. Chester H. Wells, Health Officer, Montclair, N. J.; Prof. Henry C. Sherman, of the Department of Chemistry, Columbia University, New York City; Dr. L. L. Van Slyke, of the Department of Chemistry of the New York Agricultural Experiment Station; Dr. Charles E. North, Consulting Sanitarian, a member of the New York Milk Committee and Secretary of the Commission; Dr. J. N. Hurty, Secretary of the State Board of Health, Indianapolis, Ind.; Dr. Joseph S. Neff, Director of the Public Health Department of Philadelphia, Pa.; Dr. John S. Fulton, Director of the State Department of Health, Baltimore, Md.; and myself.

As you will notice, the veterinarians' interests are represented by Dr. Melvin, and I think fairly also by Dr. Ravenel; the health departments, by several secretaries of state boards of health, by health officers of large communities—for instance, Chicago, New

York and Philadelphia; of middle-sized communities, such as Richmond, Va., Dr. Levy; and of small communities by Mr. Wells, of the Department of Health, of Montclair, N. J. The National Health Service is represented by Dr. Anderson. Various agricultural colleges are represented by Mr. Pearson, President of the Iowa State College, and by Prof. Stocking, of Cornell, and Prof. Van Slyke. After two years of deliberation the committee issued a report with the understanding that that report would be distributed by the Public Health Service. It was so distributed in May, 1912. After many thousands of copies had been distributed, and after requests for opinions had been replied to from many different sources, the commission was again called together with the view of amending the report in the light of the year's experience.

The meeting for the consideration of the report, for its revision, with a view to final publication, was held at Richmond in April. The report was issued on August 22, 1913, and is to be found in the Public Health Reports for that date. I had hoped to have a considerable supply of those reports here this morning. The New York Milk Committee have just telephoned that they have not had the supply from Washington that they expected, but that a moderate number, in fact a small number, of copies would be in the room before we adjourn this morning. They suggested that those anxious to secure copies write to the United States Public Health Service, Washington, D. C., for a copy of their report, dated August 22, 1913. If you prefer, however, if you will furnish me a list of the members I will endeavor to have a copy of the report sent to each member. I will transmit that list to Dr. Anderson, of the Public Health Service, who has the matter in charge.

Now I am going to read a few of the subjects covered in this report, those that are of particular interest, I take it, to the gentlemen who constitute this organization; and then I am going to speak to three of those subjects—not to the report in its entirety, but to three of the matters that are covered in the report.

The sections that I have marked to be read are the follow-

ing: The preamble begins with these words: "Proper milk standards, while they are essential to efficient milk control by public health authorities and have as their object the protection of the milk consumer, are also necessary for the ultimate well-being of the milk industry itself. Public confidence is an asset of the highest value in the milk business. The milk producer is interested in proper standards of milk, since these contribute to the control of bovine tuberculosis and other cattle diseases and distinguish between the good producer and the bad producer."

I will now read some more along the same line. The reason for introducing this is that I am presently going to say something about the failure of the milk business to develop as it should in some measure as the result of a lack of public confidence in milk. On this general subject of the lack of uniform conditions in the different communities they say:

"These are the result of a study of the printed rules and regulations of the cities of the United States and of foreign countries and represent an immense amount of work on the part of the special commission to which the task was assigned. Some communities are in a position to adopt all of these rules and regulations at the present time, while other communities will be obliged to adopt a few rules at a time, as public sentiment and local conditions warrant. It is realized that some of the rules will have to be modified to meet local conditions."

One of the criticisms that the report has been subject to is the fact that the rules better fit the conditions in large cities than they do those in small cities. That would mean this, that it is possible for a small city to have a better milk supply than a large one. As a general proposition I think it is true that small communities have worse milk supplies than large communities. That is by reason of the fact that they make no effort to control their milk supplies. When they do make such efforts, it is found that it is relatively easy to control them in small communities as compared with large communities. Therefore certain bacterial standards to which I shall presently refer, whilst they are the bacterial standards that we have to compromise on when we are deal-

ing with the large community, should not obtain in the small community; the small community can do infinitely better.

You will understand that the milk as it comes from a cow is occasionally free from bacteria; it is usually of low bacterial count. Occasionally there is found a cow giving milk containing but a few thousand bacteria as it issues from the udder. As a general proposition, however, the bacterial content of newly drawn milk is low. There are certain ferments that develop in milk shortly after it is drawn, the nature of which we know very little about, which are, however, bactericidal; they are something more than restraining in their action on bacteria; they seem to be bactericidal, so that at the end of about six hours there are fewer bacteria in the milk than there were at the time it was drawn, that is, in milk that has been well kept. This ferment action is a self-limited action, so that after about six hours it ceases to operate and bacterial multiplication begins in earnest. The communities therefore, that have their cows close up to their babies, that have the mouth of the baby in close juxtaposition to the cow, have no great difficulty in securing milk of a low bacterial count. Whenever you begin to interpose between the baby and the teat any sort of foreign circumstance or happening, you increase the number of bacteria that you must have in milk, from which there seems to be no practical escape. If the milk is produced on the premises where it is consumed, if any sort of effort is made to secure healthy cows, such as make for hygiene, under those circumstances the milk is very much cleaner, very much better and very much more wholesome than milk that is produced under any other circumstance. If the milk is produced a few miles away in the country, so that it needs to be hauled but a short distance, handled but by few people—the people who produce and the people who consume, let us say—but one wagon intervening between the cow and the baby, a double delivery, let us say, so that much of the milk is consumed before it is six hours old, and all of it is consumed before it is twelve or fourteen hours old, under those circumstances you can demand and can secure very much lower bacterial counts than are set by this

commission. You will understand that a bacterial standard is not an absolute thing; it is merely a measure by which the sources of the milk are to be judged; and if a milk that is but a few hours old and that has been handled by but few people has a high bacterial count, it means that the conditions under which it was produced and under which it has been kept, have been almost unspeakably bad. If, however, the milk is a day or more old, has been hauled fifty or more miles, has been hauled in a railroad train and by two or more wagons, it may have a hundred thousand bacteria without it indicating that there has been gross negligence at any point along the line. Therefore these bacterial standards are to be taken in this light: a community that cannot secure better than two hundred thousand as its standard of bacterial count, will be fair or moderately fair to the children who consume cow's milk, if they allow that to be the standard of their community. If, however, a community has cows kept on the premises, or cows within four or five miles of town, a double daily delivery of milk, it would not be at all fair to those babies if the health department were to allow a count of two hundred thousand.

Classification of Milks.

"There is no escape from the conclusion that milk must be graded and sold on grade, just as wheat, corn, cotton, beef and other products are graded. The milk merchant must judge of the food value and also of the sanitary character of the commodity in which he deals. The high-grade product must get a better price than at present. The low-grade product must bring less."

I do not know how it came about, but there is considerable public opinion that milk should be classed as milk, and that no adjectives should be applied to milk. This is difficult for me to understand, because in the whole range of commerce there is not another thing within my knowledge that is bought and sold that is not graded and classified. It is true of cotton, where we have all sorts of titles and adjectives applied to it; it is true of

wheat; it is true of meat; it is true of lard; it is true of calico; it is true of silk; it is true of iron, of steel, of cars and of elephants. Everything that is bought and sold is graded and classified except milk; and why anyone could assume that this particular commodity could thrive on a commercial basis, violating this which is a proven and fundamental rule of commerce, I have never been able to understand. It seems to me that one of the necessities, if the milk business is to thrive, is that milk should be made to conform, just as far as it is possible for it to conform, to the ordinary commercial lines, and where it does not automatically conform to such commercial lines there should be such regulation and control as would cause it to travel in those grooves where it has been demonstrated that business best prospers.

Bacteria.

The subject of bacteria in milk received more attention than any other matter brought before the commission. The commission recognizes that bacteria in milk in the majority of instances indicate dirt, or lack of refrigeration, or age, while in the minority of instances the bacteria of disease may be present. The routine laboratory methods of examining milk have as their purpose only the control over dirt, refrigeration and age, and it is a rare thing for a laboratory to undertake the examination of milk for the bacteria of disease because of the extreme difficulties in detecting them. The more efficacious method of protecting milk from infection by the bacteria of human contagion is by medical, veterinary and sanitary inspection, and by pasteurization. Milk with a high bacteria count is not necessarily harmful, but when used as a food, particularly for children, is a hazard too great to be warranted. Milk with a high bacteria count, therefore, should be condemned. Milks with small numbers of bacteria are presumed to be wholesome, unless there is reasonable ground for suspecting that they have been exposed to contagion.

I now come to the subject of "Laboratory Examination for Bacteria."

I am going to digress far enough to say that we are not infrequently disturbed by the perfection of certain laboratories; for instance, Dr. Mohler's laboratory. We get an idea that the laboratory is not a laboratory unless it has the equipment in men and in instruments that these better developed laboratories have. We are stopped by this conception of a laboratory from undertaking laboratory work in our smaller communities, those communities that cannot afford the more complete equipment that is to be found in such laboratories. Let me suggest that there is no community that is large enough to afford a public school that is not large enough to afford a laboratory for the examination of milk, at least in so far as sanitary considerations are concerned. The equipment required is simple, and for certain procedures the technical training required is hardly worthy of consideration. As you, gentlemen, very well know, the simple Babcock instrument has now carried the testing of butter fat in milk to the farm, so that it is done by the farmer's son, and not infrequently by the thoroughly untrained farmer himself. There is a fair method of testing the sanitary quality of milk that is even simpler than the application of the Babcock test, and that is the dirt test—the filtering of a given quantity of milk through a filter for the purpose of disclosing the amount of dirt that is in that sample. For instance, the milk having been thoroughly agitated, a pint is removed therefrom, and that pint is filtered, and the amount of dirt caught on the filter is held for purposes of demonstration and education. Milk can be filtered through a pledget of cotton; it can be filtered cold—however, it filters better warm; it can be filtered with no apparatus at all, except a funnel and a pledget of cotton. However, that is rather slow; we will be better satisfied all around if we have a little bit more apparatus than that. In the city of Chicago we have been using an ordinary plain, simple filter with a pledget of cotton in the bottom of the filter; that filter runs into a vacuum bottle, and in that vacuum bottle a small degree of vacuum or low-air pressure is maintained. You can get enough vacuum by merely attaching this vacuum bottle to a current of running water, so that

any place that has running water has about all of the equipment that is needed for the making of the dirt test. For a while we had our men equipped with a large rubber bulb that would hold about a pint, and they would create a slight degree of vacuum in that bottle by simply exhausting the air with the bulb. I am going into these little details, because they show that not much of apparatus is required for the dirt test. Certainly it would be easy indeed to equip the laboratory of your public school with the Babcock test; and you could not do a better thing for the milk supply of your community, and for the people of the community, and for the children themselves, than to have them periodically and systematically examine the milk supplies of your community with the Babcock test. Some of you here, I am sure, have had experience as school teachers. You will understand the advantage from the pedagogic standpoint of using for the purposes of study something in which there is a human or personal interest. Therefore your children in school will learn very much more about the question of fat and certain chemical questions if they use things that they bring from their homes than if they use things that appeal to them altogether from a didactic standpoint. The same thing is true of the dirt test. There is no reason why the students of the public schools should not regularly and systematically apply the dirt test to the milk supply of their community.

Now, a bacterial count—that is to say, a quantitative count—is a matter of somewhat greater difficulty. It requires a little bit more of equipment, but it requires very little more of equipment. If the counts are to be made at incubator temperatures, an incubator can be constructed at very small cost. You are to remember that the microscope required for a quantitative bacterial count is a very low power microscope, and therefore the expensive microscope equipment that you ordinarily have in mind when you think of bacterial work is not required for the quantitative counts of milk, or water, or other substances, in a community. Without going into further detail, it would be easily possible for the senior grades in your local schools to carry out

bacterial examinations of the milk supplies of those communities. I mean now quantitative examinations, and that is about all that we put very much stress upon. As a practical matter, administrative matter, we do not get very much from qualitative examinations of milk.

There are a few bacteria, pathogenic for the human animal that it has been demonstrated are found in milk. The best known, of course, of these is the tubercle bacillus. You heard Dr. Park tell his story last night, how they found that about 12 per cent. of the milk supply in New York City contained tubercle bacilli. Quite uniformly those tubercle bacilli are virulent for guinea pigs. You heard his further statement that the proof, such as is obtainable on such a question as this, is that a large percentage of those tubercle bacilli are virulent for the human animal; a larger percentage of them are bovine tubercle bacilli, virulent for children in the mid-period of child life; many of them are human tubercle bacilli, virulent for younger children, for babies, and those in the first two years of life, producing pulmonary tuberculosis in those cases, and a small percentage are virulent for adults. There is some evidence, and I think quite conclusive evidence, that typhoid bacilli have been found in milk. Of course we have that presumptive evidence that is quite conclusive and has been so accepted by the courts, found in the development of typhoid fever amongst people who have been consuming a certain milk, in the handling of which milk, at some point or other, there has been probably infection with typhoid. Of course that evidence is quite conclusive to fair-minded people. It is generally accepted as conclusive when offered in courts of law. At the same time it is nothing more than presumptive proof. They have, however, demonstrated that the typhoid bacillus has been found in milk, making use of the Weidel reaction. Then there is septic sore throat, in which I think the proof is quite definite that certain of the streptococci are responsible for the spread of the disease; but just the relation between those streptococci and the streptococci derived from the udder of the cow has not been established.

Now, that is about as much as we know about the pathogenic bacteria in milk. It is not of very much practical or administrative value, as I said a while ago, as a general proposition. After you have had the lapse of the period of incubation, the development of the disease, the number of days required for purposes of the inquiry, the condition responsible for the infection of the milk has terminated so that it is not of any practical value from that standpoint at all. But the use of the bacterial standard as a method of measuring the standards, the sanitary standards, the hygienic standards, the probabilities of proper care in the production of milk on the part of those who are responsible for its production and for its handling, the advisability of using the bacterial count for these measuring and estimating purposes I think has been fully established.

I have something here on the subject of "Laboratory Examinations for Bacteria." It is proposed to grade milk into the following three grades:

"*Grade A—Raw Milk.* Milk of this class shall come from cows free from disease as determined by tuberculin tests and physical examinations by a qualified veterinarian and shall be produced and handled by employees free from disease as determined by medical inspection by a qualified physician, under sanitary conditions, such that the bacteria count shall not exceed 100,000 per cubic centimeter at the time of delivery to the consumer. It is recommended that dairies from which this supply is obtained shall score at least 80 on the United States Bureau of Animal Industry score card.

"*Pasteurized Milk.* Milk of this class shall come from cows free from disease as determined by physical examinations by a qualified veterinarian and shall be produced and handled under sanitary conditions such that the bacteria count at no time exceeds 200,000 per cubic centimeter. All milk of this class shall be pasteurized under official supervision, and the bacteria count shall not exceed 10,000 per cubic centimeter at the time of delivery to the customer. It is recommended that dairies from which this supply is obtained shall score 65 on the United States Bureau of Animal Industry score card."

I may say that one of the most extensive discussions that we had was as to the score required on the Animal Industry score card. There were men who believed that those scores were too low. The question was finally settled, however, when we bore in mind the difference in the personal equation of the scorer; the 90 of one man is about the same as the 45 of another man; and if we put a score that was too high, the result would be that some fellow would merely lower his standards of scoring, and in that way bring up his average score.

"*Grade B.* Milk of this class shall come from cows free from disease as determined by physical examinations, of which one each year shall be by a qualified veterinarian, and shall be produced and handled under sanitary conditions such that the bacteria count at no time exceeds 1,000,000 per cubic centimeter. All milk of this class shall be pasteurized under official supervision, and the bacteria count shall not exceed 50,000 per cubic centimeter when delivered to the consumer.

"It is recommended that dairies producing Grade B milk should be scored and that the health departments or the controlling departments, whatever they may be, strive to bring these scores up as rapidly as possible.

"*Grade C.* Milk of this class shall come from cows free from disease as determined by physical examinations and shall include all milk that is produced under conditions such that the bacteria count is not in excess of 1,000,000 per cubic centimeter.

"All milk of this class shall be pasteurized or heated to a higher temperature, and shall contain less than 50,000 bacteria per cubic centimeter when delivered to the consumer. It is recommended that this milk be used for cooking or manufacturing purposes only.

"Whenever any large city or community finds it necessary, on account of the length of haul or other peculiar conditions, to allow the sale of Grade C milk, its sale shall be surrounded by safeguards such as to insure the restriction of its use to cooking and manufacturing purposes."

Now, gentlemen, I think I will read to you one other section under the title, "Cows."

"Cows.

"*Requirements.*—1. A physical examination of all cows shall be made at least once every six months by a veterinarian approved by the health authorities.

"2. Every diseased cow shall be removed from the herd at once, and no milk from such cows shall be offered for sale.

"3. The tuberculin test shall be applied at least once a year by a veterinarian approved by the health authorities.

"4. All cows which react shall be removed from the herd at once, and no milk from such cows shall be sold as raw milk.

"5. No new cows shall be added to a herd until they have passed a physical examination and the tuberculin test.

"6. Cows, especially the udders, shall be clean at the time of milking.

"7. No milk that is obtained from a cow within 15 days before or 5 days after parturition, nor any milk that has an unnatural odor or appearance shall be sold.

"8. No unwholesome food shall be used."

Milk from cows reacting to the tuberculin test can be pasteurized and sold under proper supervision.

In addition to those requirements certain recommendations are made.

"RECOMMENDATIONS.

"1. Every producer shall allow a veterinarian employed by the health authorities to examine his herd at any time under the penalty of having his supply excluded.

"2. Certificates showing the results of all examinations shall be filed with the health authorities within ten days after such examinations.

"3. The tuberculin tests shall be applied at least once every six months by a veterinarian approved by the health authorities, unless on the last previous test no tuberculosis was present in the herd or in the herds from which new cows were obtained, in which event the test may be postponed an additional six months.

"4. Charts showing the results of all tuberculin tests shall be filed with the health authorities within ten days of the date of such test.

"5. The udders shall be washed and wiped before milking."

Now, gentlemen, I think I will close because I notice that we have come to the hour for your section meetings, with a brief discussion of the question of the welfare of the milk industry, something concerning the factors that are responsible for the fact that the milk industry is not developing co-ordinately with the other industries. In the first place, there is not a particle of organization, as we know the word in these later years, applied to the milk business. At no stage of production or of selling is the milk business organized in the way that other businesses are organized. The men engaged in the business quite generally have resisted efforts to grade and classify milk. They have hesitated at the educational effort necessary to re-educate their people, so that they would appreciate the differences between good and bad milk, as expressed by the letters A, B, C, or other designations. They have preferred that the ordinary custom should remain of calling milk *milk*, and making good milk sell in competition on the same basis with poor milk. One of the reasons why there has not been the development of the milk business that there should have been is because of the periodic outbreaks of distrust and fear that result from periodic demonstrations of the ability of milk to carry bacteria capable of causing infection. Beyond doubt the incoming of pasteurization will reduce the number of milk outbreaks, but, nevertheless, there will be from time to time articles in the papers, telegraphed widely throughout the country, emphasizing the dangers of drinking milk, and the non-discriminating public will refrain from drinking all kinds of milk until that particular fear has been allayed.

By reason of the fact that the milk business is a pretty good-sized business, we lose sight of the fact that it ought to be a very much larger-sized business; we lose sight of the fact that it has not grown and has not developed as have other businesses in the country, in spite of the fact that it should have grown and should have developed more than those other businesses in the country.

Milk is more nearly an ideal food; it finds a broader range of use than most any other food. It has many different possibilities aside from those for which it is at present employed. I have not time to develop those possibilities. I am going to put this single illustration, and then leave you for your section work.

When the milk commission was en route to Richmond, in April, they were invited to stop off at Annapolis and visit the government dairy in connection with the institute there. We found that several years ago they had a good deal of minor digestive disorder. They investigated the cause of that disorder. They found that from time to time they had outbreaks of typhoid fever. A cursory investigation was made, and after a while it occurred to them to look into the general milk supply of that community, and particularly into the milk supply that was drawn on for the academy. They found that the academy supply was quite bad. The government was finally persuaded to put in its own dairy. When they put in the dairy they found but one location available, and that was quite near the hospital. The doctors at the hospital did not want the dairy near their hospital. They said: "It will fill our hospital with flies." In reply to that the people in charge of the dairy said: "Well, if you will look after your flies, we will look after our flies, and we will promise not to disturb your hospital with the dairy flies if you will promise not to disturb our dairy with the hospital flies." They built in a dairy that was very clean. In order that there might be no flies they took proper care of the manure. They not only went after the flies in the stable, but they distributed fly-traps out over the pasture in order to catch those flies that in fair weather stayed out of doors. In consequence of that fact they have been very much more disturbed by hospital flies than the hospital has been disturbed by dairy flies. Immediately the milk is drawn it is chilled. They have a chilling apparatus in close proximity to the place where the milk is drawn. Then the milk is kept cold and is consumed by the students in a relatively short while. The cows are tuberculin tested. They are examined by veterinarians from the Bureau of Animal Industry. In fact, the entire installation has been under the direction of the Bureau of Animal In-

dustry. The milk goes over there to the boys with an exceedingly low bacterial count, clean and cold, and it is consumed within a few hours.

Now, the point to my story is this. There are 700 students in that academy. In olden times there were 120 sick-days per month on an average, from minor digestive disorders. You will understand we are not talking now about babies; we are talking about great, husky, double-jointed naval cadets, men whose digestive apparatus can better withstand disease than can the digestive apparatus of the average adults of the community. By sick-days we mean days excused from duty. One hundred and twenty sick-days a month would mean that each student would have an average of about one-fifth of a sick-day during the month. When they put in this milk the number of sick-days from digestive disorders materially decreased, so that in no month since that was installed have they had more than twenty sick-days from minor digestive disorders, and they have had no illness that was even presumptively a milk-born illness. That is to say, they have decreased the excuse rate to as low as one-sixth of what it formerly was, at the maximum. That is to say, the maximum rate since this new milk was used is but one-sixth of the rate before it was used. There have been months when there have been no sickness days and other months with five and six and seven and eight days off duty, as compared with 120. Twenty was the worst month that they have had, and that happened to be a month when they had a lot of football games, taking the boys off the campus.

The second point is this: Those 700 boys consume 300 gallons of milk a day. Now, there is not a community in America that has one-quarter of that quartage. There is no community in America that has anything like that quartage, and if there was a grade of milk on the market that was comparable with the grade of milk that is being supplied to the Naval Academy students, the consumption of milk would be very much increased over the amount as at present consumed. Of course there would develop along with that other uses for milk that would still further increase the amount consumed, and of course that would carry with it a still greater development of the milk industry.

THE USE OF MILK CULTURES OF B. BULGARICUS IN THE PREVENTION AND TREATMENT OF BACILLARY WHITE DIARRHEA OF YOUNG CHICKS.*

By L. D Bushnell and Otto Maurer, Manhattan, Kansas.

Metchnikoff's discoveries of the influence of the lactic ferments upon the intestinal flora in health and disease opened a wide field for the treatment of the various disturbances caused by a deviation of the intestinal flora from the normal. The principles of this form of bacterial therapy are too well known to be reiterated here. Though this cheap and simple form of treatment has rapidly conquered an important place in human medicine, it has, until recently, been almost entirely ignored by the veterinarian. The favorable results which Standfuss reported on the use of yoghurt in epidemic calf-diarrhea suggested to the authors the use of this preparation in the treatment of white diarrhea in young chicks.

This disease, the one most dreaded by the poultry farmer, and which makes poultry raising unprofitable on some farms, has been thoroughly investigated by L. F. Rettger, of the Sheffield Scientific School, Yale, in connection with Stoneburn, formerly of Storr's Experiment Station. Their results were met with scepticism by many, but have since been fully confirmed by Gage and Jones. In Bulletin 74, the latest report of the Storr's Experiment Station, on bacillary white diarrhea, this disease is aptly described as follows:

"As in many other diseases, the symptoms may vary within certain limits in the individuals affected. We do not wish to be understood that all of the following symptoms will be observed

* From the Bacteriological Laboratory of the Kansas State Agricultural Experiment Station.

in every chick suffering from bacillary white diarrhea; but almost all of them will be apparent in epidemics of any considerable size.

"The earliest deaths may occur within a very short time after hatching, without any prominent symptoms, excepting perhaps weakness and lack of vitality. The characteristic whitish discharge from the vent soon makes its appearance in the flock, the time depending, without doubt, upon the virulence of the organism and mode of infection. The discharge may be slight or profuse, in color white or creamy, sometimes mixed with brown. The voided matter has a more or less sticky or glairy character. It may simply streak the down below the vent or may cling to the down in sufficient quantity to seal up the vent. This is the condition that poultry-men designate as 'pasting up behind.' This latter condition, however, is not necessarily indicative of white diarrhea.

"The chicks soon become listless and sleepy, inclined to huddle together and remain under the hover much of the time. They seem to lose appetite and do not eat much. Frequently when they attempt to take food, their action is more or less mechanical. The wings begin to droop or project slightly from the body, with feathers ruffled. In acute cases the eyes are closed, and the chicks become indifferent to everything that goes on about them. Many of the chicks peep or chirp constantly, the sound being shrill or weak, according to the strength of the individual. Frequently when endeavoring to void the excreta, the chicks utter a shrill twitter, apparently a cry of pain. The breathing may be labored, the abdomen heaving with each breath. Occasionally one may note a certain amount of gasping.

"During the progress of the disease the chick may die suddenly while still fairly strong. When the disease is prolonged the chicks gradually waste away, becoming weaker and weaker until they are scarcely able to support their own weight. In this stage they will often be seen to rest against foreign objects for support, standing with legs braced apart, squatting or lying utterly helpless.

" Frequently the chicks take on the appearance which poultrymen call 'short-backed.' The back seems to shorten and the abdomen to protrude out of proportion, causing the chick to look 'stilty' as compared with one of normal development. This condition Woods accurately describes as follows:

" 'The weakling is almost always big-bellied, the abdomen protruding to the rear so that it bunches out behind, well out of line with the vent, with the result that the chick looks as if the tail-piece and backbone had been pushed forward and in, just above the vent.'

" With few exceptions, the deaths from typical bacillary white diarrhea occur while the chicks are under one month of age. After this a few straggling deaths may be expected, and if complications set in, a high mortality may be observed. The chicks which have had bacillary white diarrhea seem to be greatly weakened in constitution, and fall an easy prey to disorders which would be resisted easily by normal chicks.

" Those which survive remain more or less stunted in their development. Frequently they are misshapen, with long beaks and 'crow-heads,' and with imperfect feathering. In every way they impress one as being weak and lacking in vitality. This condition may persist indefinitely, or the bird may slowly regain vigor and vitality and finally make fairly satisfactory development.

" Findings upon autopsy:

" *Crop*—Empty or partially filled with slimy fluid or with food.

" *Lungs*—Apparently normal. (Tubercles not observed.)

" *Liver*—Pale, with streaks and patches of red. The congested areas are usually large in size. Occasionally epidemics will be met with in which the liver is more or less congested throughout. In such cases the portion of the stomach lying in contact with the liver is inflamed.

" *Kidney and Spleen*—Apparently normal.

" *Intestines*—Pale and for the greater part empty. A small amount of dark grayish or brownish matter frequently present.

"*Ceca*—With few exceptions but partly filled with a grayish soft material. Only occasionally cheesy or firm contents.

"*Unabsorbed Yolk*—Usually present, varying in size from a pea to a full-sized yolk. The color may vary from yellow to brownish green or nearly black. In consistency there is also much variation. Frequently it looks like custard and again it is more or less dry and firm. Unless the chick has been dead for some time, the yolk is not putrid but merely stale.

"The chick as a whole appears more or less anæmic and emaciated. The muscles of the wings, breast and legs may be almost completely wasted away."

To establish the presence of white diarrhea in a mature flock, an examination of the ovaries of all the birds that are killed for the market is of great service and will generally reveal the existence of the disease. In the Storr's Experiment Station Bulletin 74, ovaries infected by B. Pullorum are described "as being made up of ova of two distinct types, the normal and the abnormal. The normal may be of varying sizes and resemble those of perfect ovaries. The abnormal may also vary as to size, but often as many as twelve or more ova which are of uniform size may be seen. When quite small the white diarrhea cysts are less angular and irregular than those which are larger. The color of the larger ova may vary greatly. They are usually more or less mottled. Some are light in color; others much darker; almost all shades of yellow and brown may be seen. Occasionally the color is so dark and of such a character as to suggest gangrene."

"The larger abnormal ova or cysts are usually quite angular, and of a firm consistency. Sometimes they are so compressed as to appear flattened. The contents of the white diarrhea ova are, as a rule, quite characteristic: They consist chiefly of a solid, cheesy matter, which is usually permeated by a clear, amber-colored fluid. The bacterium of white diarrhea may be recovered from the contents with ease."

The bulletin from which this description is taken contains color plates of normal and infected ovaries that admirably bring out the points of diagnostic importance.

The hens with infected ovaries frequently lay infected eggs and the chickens hatched from such eggs invariably fall a prey to the disease. These chicks that derive the disease through the infected ovaries of their mothers form the most prolific source of infection for their originally healthy companions. We can, therefore, easily realize the grave danger represented by the widspread distribution of day-old chicks, which has become so popular during the last few years. There should be a law compelling all breeders that sell baby chicks or eggs for hatching to have their breeding stock tested for the absence of white diarrhea. This can be done by the examination for B. Pullorum of a number of eggs from the hens that are to be used for breeding. The macroscopic agglutination test of the fowl's sera against B. Pullorum has also been found very reliable by Jones. This test, which is easily done, will become a valuable means for diagnosing and eradicating white diarrhea. It is only a question of time when the agricultural experiment stations and commercial laboratories will equip their bacteriological laboratories for the diagnosis of white diarrhea by isolating B. Pullorum from eggs, by agglutination tests and by the examination of the ovaries. In the meantime poultry-men should carefully examine the ovaries of all killed birds for evidences of white diarrhea; they should get rid of infected flocks as soon as possible, and by no means use their eggs for hatching. Only such breeders whose flocks have been found to be free from white diarrhea, by competent bacteriologists, should be permitted to sell baby chicks and eggs for hatching. It may be some time yet before our legislatures pass laws to that effect. In the meantime the Agricultural Experiment Station or the powerful American Poultry Association should grant certificates to those breeders who comply with their rules ensuring the absence of white diarrhea from their flocks. The existence of such certified poultry farms and the great superiority of their products would soon induce all breeders to submit their flocks to examination by experts and to do their best to prevent the introduction of the disease into their flocks. In this manner the tremendous losses

which the poultry industry sustains from this disease could be reduced to a minimum.

The causative organism of bacillary white diarrhea has been named B. Pullorum by Professor Rettger, its discoverer. The following are the most important morphological and cultural characteristics of this organism:

B. Pullorum is a rod, .3 to .5 by 1 to 2.5 m., rounded ends. It occurs singly or very rarely in chains. It is non-motile, does not produce capsules or spores. It stains readily and uniformly with ordinary aqueous anilin dyes, and is gram-negative. The colonies on agar are discrete, at first resemble the translucent pin-point colonies of the streptococcus. They enlarge later; upon gelatin the colonies resemble those of the typhoid bacillus. Little growth occurs upon potato. Milk is a suitable medium, but there is little change, no coagulation and no proteolysis.

Physiology—The organism is aërobic and facultative anaërobic. The optimum growth occurs at about 37° C. Dextrose and mannite are fermented, with the production of both acid and gas. Maltose, lactose and saccharose are not fermented. Indol is not produced.

From its characteristics we see that B. Pullorum belongs to the colon-typhoid-dysentery group of organisms.

Judging from the inhibitive action which B. Bulgaricus exercises on this group, a study of its effect in white diarrhea seemed quite promising. Numerous investigations have been made on the effect of B. Bulgaricus on the intestinal flora and their putrefactive products. They have been reviewed by Einhorn, Wood and Züblin, whose paper is highly recommended to all interested. I should like to review here only a few observations on the effect of B. Bulgaricus on B. Coli and other intestinal bacteria that are of special interest in this connection. Katschi found B. Coli only very rarely in the feces of Bulgarian shepherds that habitually consume large quantities of yoghurt. He also found a rapid decrease of B. Coli in the feces of patients under treatment; this made itself noticeable as early as one week after B. Bulgaricus was fed.

T. v. Kern who studied the effects of the products of B. Bulgaricus on B. Coli *in vitro* and *in vivo* also found a marked antagonizing and inhibitive action of B. Bulgaricus upon B. Coli.

Cohendy found B. Bulgaricus in the feces within three to five days after feeding was begun. After eight days the organism was constantly present; it could occasionally be found even twelve days after its introduction had been discontinued, while the lactic acid bacteria from ordinary sour milk could maintain themselves for only two days.

Belowonsky studied the influence of food, abundantly infected with B. Bulgaricus, on the intestinal flora of mice. His conclusions are summarized as follows by Kendall: "The Bulgarian ferment modifies the normal intestinal flora of mice by a general alteration in their character and by elimination of putrefactive forms. First, there is a diminution in the total number of bacteria as well as a lessened virulence of the organisms in the feces when these are introduced intraperitoneally or subcutaneously into other animals. Second, the action is not attributable to the formation of lactic acid alone, but also to certain products inhibitory in nature, formed by the bacilli themselves. Third, the organisms become more or less established in the intestine about the tenth day in adult mice and persist without further re-inoculation for a considerable but variable interval of time. Fourth, the cultures seem to have exerted a beneficial action upon the mice, particularly on those infected with the organisms of mouse typhus; in this case the results are due exclusively to the lactic acid."

Duclaux found an enormous decrease in the total number of bacteria in the feces under the influence of yoghurt. After feeding this preparation for four weeks, the number of colonies growing from 0.1 gr. of feces was reduced from 26,000,000 to 12,000, the latter being mostly lactic acid bacteria. Wejnert observed a decrease to one-fourth the original number of colonies in the feces, when ordinary sour milk was fed, while the numbers went down to one-twentieth (average) when Metchnikoff's lacto-bacillin milk was given.

Other authors, as Herter and Kendall, do not report as favorable results. Their experiments were carried on with monkeys and are summarized as follows: First, by feeding a Rhesus monkey for two weeks exclusively on milk fermented with B. Bulgaricus (but containing also some yeasts) it was possible to maintain an acid reaction throughout the digestive tract. The acid reaction was more pronounced above the ileo-cecal region than at this region or below it. The acidity decreased progressively from the ileo-cecal region to the anus. Lactic acid was detectable at every point in the digestive tract that was tested, the reaction growing less marked below the ileo-cecal region.

Second, exclusive feeding for two weeks with milk fermented with B. Bulgaricus failed to establish the predominance of this organism in the ileo-cecal region or in the large intestine. In the latter situation the number of bacilli of this type was relatively small and decreased towards the anus. Thus in the regions characterized by most active putrefaction the lactic acid bacilli failed to establish themselves in relatively large numbers.

It may be of interest in this connection to inquire into the most important morphological bio-chemical features of B. Bulgaricus. This organism derives its name from its prominent rôle in the fermentation of the Bulgarian sour milk, called yoghurt. B. Bulgaricus measures about 1 x 4.5 m., has rounded ends and occurs singly and in pairs, rarely in short chains. It stains well with the ordinary aniline dyes and retains Gram's stain, unless it be old when it often represents a granular and mottled appearance. The organism only grows in media that contain carbohydrates. While its growth on artificial media is very meagre, it grows luxuriously in milk, producing a finely flocculent soft coagulum with little expulsion of whey. Bertrand and Weissweiller, who studied the chemical effect of B. Bulgaricus on milk, found that less than 10 per cent. of the casein is peptonized and utilized as a bacterial food. A small amount of the fat is saponified. Practically all of the lactose is transformed into lactic acid, of which 25 g. are frequently produced per liter. Acetic, formic and succinic acids are produced in small amounts

only; in general, their total does not amount to more than one-half gram per liter.

Even if B. Bulgaricus would grow in abundancy only in the gizzard, stomach and small intestines, as suggested by the studies of Einhorn, Wood and Zublin, it might render the valuable service of killing or at least suppressing the B. Pullorum that have gained access to the food or drink of the chicks. In this manner the access of B. Pullorum to the large intestines might also be prevented, though B. Bulgaricus might fail to multiply or maintain itself there. In the digestive tract of the newly born chicken the B. Bulgaricus stands a much better chance to gain a foothold than in the digestive tract of adult animals. The earlier B. Bulgaricus is fed to the chicks, the better are the chances for its becoming the dominating habitant of the digestive tract, since there is as yet no established flora present with which the B. Bulgaricus has to compete. In those chicks that were hatched from infected eggs the lactic acid therapy cannot be expected to result in benefit. In these cases the B. Pullorum has already reached the circulation by the time B. Bulgaricus can be fed and, of course, B. Bulgaricus or its products cannot exert any influence on the B. Pullorum in the circulation and organs. To be effective, therefore, the sour milk has to be fed before septicemia is established. The earlier it is fed, the better are the chances for its suppressing the proliferation in the intestinal tract of B. Pullorum and therefore for preventing a bacteremia due to this organism. With these considerations in mind the following experiments were arranged:

During the first part of August eighty-one chicks were hatched in an incubator from one hundred and fifty white leghorn eggs that were secured from a poultry farm, on which white diarrhea did not exist. The chicks were uniformly divided according to size and apparent vigor into three lots of twenty-seven each.

Treatment of the Different Pens.

Pen I.—Twenty-four hours after hatching a few drops of a young culture of B. Bulgaricus in milk was placed into the

mouth of each chick by means of a medicine dropper. For the following four weeks a frequently renewed milk culture of B. Bulgaricus was constantly kept in the pen, so that the chicks always had access to it. The cultures were prepared by heating fresh, sweet milk for one-half hour to 100° C. and, after cooling, inoculating it with B. Bulgaricus. The cultures were kept in the incubator for not less than 24 hours, nor more than 48 hours. An unpleasantly acid flavor was generally produced within 48 hours. The curd was soft, not much whey being expelled. The strain of B. Bulgaricus used was obtained from the University of Wisconsin.

When the chicks were about 40 hours old, they received a few drops of a 24-hour bouillon culture of B. Pullorum (obtained from Prof. Rettger) by means of a medicine dropper. From now on, 24-hour bouillon cultures were mixed with the mash, the organism being fed in this manner until the chicks were one week old.

Pen II.—When twenty-four hours old, the chicks received a few drops of a 24-hour bouillon culture of B. Pullorum by means of a medicine dropper. Next morning when the chicks were about 40 hours old, a culture of B. Bulgaricus in milk was sprinkled before them. The white spots of curdled milk immediately attracted their attention and they were soon engaged in picking them up.

The feeding of B. Pullorum and B. Bulgaricus were continued as described for Pen I.

Pen III.—The 24-hour-old chicks were given a few drops of a 24-hour-old bouillon culture by mouth. For one week B. Pullorum was fed as described for Pen I. This pen did not receive any cultures of B. Bulgaricus.

These experiments were begun on August 23 and continued for eight weeks, or until October 21. The chicks were looked over every day to detect deaths, and they were weighed at the age of four, six and eight weeks. The following tables give the results of the experiments:

SEPTEMBER 23.

Number Pen.	Original Number.	Number Alive.	Number Dead of Disease.	Per Cent. Dead of Disease.	Total Weight.	Average Weight.
Pen I.....	27	20	6	22	6.73	.34
Pen. II.....	27	14	11	41	5.49	.39
Pen III.....	27	10	17	63	2.97	.30

OCTOBER 7.

Pen I.....	27	15	10	37	7.94	.53
Pen II.....	27	9	16	60	5.46	.61
Pen III.....	27	4	23	85	2.2	.56

OCTOBER 21.

Pen. I.....	27	8	17	63	6.03	.75
Pen II.....	27	6	19	70	5.02	.84
Pen. III.....	27	3	24	89	2.55	.85

These data show in a striking way the beneficial effect of B. Bulgaricus in white diarrhea. As might be expected, this effect is especially marked when the sour milk is administered before infection with B. Pullorum has occurred. This is clearly expressed by the low mortality of Pen I. as compared with Pen III. The difference in mortality in the two pens is 41 per cent. after four weeks, and 48 per cent. after six weeks, in favor of Pen I. From the sixth week until the end of the experiment, that is, eight weeks after the chicks were hatched, the mortality records show a less striking difference, it being only 26 per cent. less in Pen I. than in Pen III. This increased mortality in Pen I. during the last four weeks is probably due to the cold and damp weather to which the chicks were exposed from October 7 to October 21. This influence of the weather could make itself felt more clearly in Pen I. than in Pen III., because on October 7 there were fifteen chicks left in the first pen, while only four, probably the most hardy and resistant ones, were left in Pen III. Perhaps the high death rate in Pens I. and II. during the last two weeks might have been prevented by feeding B. Bulgaricus for a longer period. Jones found recently that B. Pullorum may under certain rare conditions produce fatal septicemia in mature stock. Perhaps these conditions were present during the last two weeks of our experiment. Unfortunately the exact cause of

the deaths occurring during the last two weeks could not be ascertained, since one of the authors was absent at the time. So it must be doubtful whether these deaths are due to the unfavorable weather, or due to some subsequent infectious disease. There is no doubt, however, that the deaths occurring earlier in the experiment were due to white diarrhea. All the symptoms described above were present and B. Pullorum was identified in the bodies of all the chicks examined. The disease was also considered an excellent example of white diarrhea by a poultry-man who had experienced many outbreaks of the disease.

Pens II. and III. were infected with B. Pullorum when they were 24 hours old; Pen II. did not receive B. Bulgaricus until 16 hours after infection with white diarrhea, while Pen III. did not receive any sour milk at all. In this manner we intended to determine whether B. Bulgaricus is able to prevent fatal septicemia after B. Pullorum has had some time to establish itself in the digestive tract of the birds. The results were most encouraging. At the end of six weeks the mortality in Pen II. is 26 per cent. lower than in Pen III., though after eight weeks this figure is reduced to 19 per cent., probably for the reasons just given for the increased mortality in Pen I. during the last two weeks.

We see that the mortality in Pen I. is considerably lower than in Pen II. This probably is due not only to the feeding of B. Bulgaricus before infection with B. Pullorum occurred, but may be partly explained by the fact that the birds in Pen I. were infected with white diarrhea 16 hours later (at an age of 40 hours) than the birds in the other two pens. Since the period of greatest danger from white diarrhea lies within the first 48 hours and is passed after birds have reached an age of four days, this difference in the time of infection of Pen I. and the other two pens may be partly responsible for the great difference in mortality.

Whether the beneficial effect of B. Bulgaricus is due to the inhibitive effect of B. Pullorum of the lactic acid produced, or to a direct antagonizing action by a specific ferment (such as, for instance, B. pyocyancus possesses against B. anthracis), or simply

to a substitution and crowding out of B. Pullorum by B. Bulgaricus, which finds more favorable conditions for growth than the former, could only be decided by extensive further investigations. Rettger suggests another possible explanation. The sour milk seems to greatly stimulate the vitality and growth of the chicks. By increasing the vitality of the chicks, their resistance to white diarrhea may be increased. This agrees with the observation that white diarrhea is especially liable to attack, and produces the worst ravages in flocks of low vigor. The remarkable stimulating effect of sour milk on the growth and vitality of the fowls, which Rettger observed with his ordinary sour milk was not found, in our experiments, to apply to milk soured by B. Bulgaricus. It may be that the heating of the milk which precedes the inoculation with B. Bulgaricus is responsible for this. Besides producing certain chemical changes in the milk, perhaps making the proteins less digestible, heating kills all the various vegetative forms of bacteria in the milk and might thus be in some way responsible for the fact that our yoghurt-fed chicken did not show the remarkable superiority in weight, size and vigor that Rettger produced by feeding ordinary sour milk. Or perhaps pure cultures of the Bulgarian bacillus do not eliminate B. Pullorum as rapidly as does ordinary sour milk. Northrup has shown in her work "Upon the Influence of the Products of the Lactic Organisms upon B. Typhosus," that the minimum acidity produced by Bact. lactis acidi which will destroy B. typhosus is 37° in lactose broth, corresponding to 80° acid in milk and 25° acid in whey. The minimum inhibitive acidity produced by B. Bulgaricus is 53° acid in lactose broth, corresponding to 208° acid in milk and 66° acid in whey. She concludes further: "If certain species of micro-organisms are present in milk, they may, either by growing in association with the lactic bacteria or by some of their own metabolic products, cause a more rapid destruction of the typhoid organisms than the lactic acid bacteria are capable of causing alone." Marshall and Farrand have shown that there is marked associative action between certain other organisms and the lactic bacteria in milk. Or, as

shown by the work of Klotz, that small doses of lactic acid per os influenced metabolism favorably, while larger doses prevent this tonic effect. At any rate, a comparison of our results with those given by Rettger in Storr's Bulletin 74 do not show any superiority of milk cultures of B. Bulgaricus over ordinary sour milk, especially when we take into account the ease with which ordinary sour milk is produced.

The experiments described above are, of course, far from exhaustive. They are only tentative and were merely undertaken for orientation, at a time when we did not know anything of Rettger's work on the use of sour milk in white diarrhea. Unfortunately the experiments could not be enlarged and continued on account of one of the author's leaving the Experiment Station and on account of lack of funds. Even as they are, the experiments conclusively show the effectiveness of milk cultures of B. Bulgaricus in bacillary white diarrhea. They are published, therefore, as a corroboration of Rettger's more exhaustive studies on this subject and with the view of attracting attention to this cheap and promising way of combatting the worst scourge of the poultry yard.

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FIRING.*

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The term firing, in its present-day usage, refers to the application to the tissue of heated metal (the actual cautery), to produce a counter irritation for the treatment of pathological conditions, chiefly lamenesses, in the locomotory organs. It is a strict veterinary term. Not infrequently it is incorrectly used synonymously with cauterization, a more general term, the meaning of which includes the charring of tissues for a wide variety of purposes, using either heated metals or caustic drugs to accomplish the results. Firing, therefore, is but one type of cauterization and accomplished by the application of a heated metallic instrument to the tissues to be treated and for the purpose of relieving pathological conditions in the locomotory organs. It is a specific rather than a generic term.

Firing produces, in the tissue fired, an acute inflammatory process, the severity of which varies with the degree of cauterization. A study of the pathology of acute inflammations shows that the character of an inflammatory reaction, based upon the exudation, varies with the causative irritant. Thus one type of an irritant will create a purulent exudate; another irritant, a fibrinous exudate; another, a serous, and so on down the list. Cauterization (burning) is a type of irritant that produces a pure, serous inflammatory process. The exudate in a burned area is abundant; it is a serum of relatively low specific gravity and great fluidity; it contains all the ferment constituents of the body fluids, but has no fibrin or cellular content and is not coagulable under body conditions. It is because of these peculiari-

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ties that firing becomes so serviceable in the treatment of chronic inflammation causing lameness. How, we shall see later.

There is another feature about the acute inflammation of a burn that is of interest and importance in this connection. It is this, that in such a reaction there is a maximum of exudation with a minimum of tissue degeneration. The pathological process in an acute inflammation may be separated into three parts, viz., the hypermia, the exudation and the tissue degeneration. Every acute inflammation has three factors, but in the different inflammations they vary in their relation to each other. They vary not only in character, but also in amount and extent. Thus one irritant may cause an inflammation in which there is a considerable degeneration of tissue, but with slight exudation, and in another inflammation the reverse may be true. In firing as stated before, there is a reaction in which there is an abundant serous exudate and a minimum amount of tissue injury, providing that the burn is of the correct degree and providing also that the actually burned tissue is not considered.

The vesicant drugs and chemicals are irritants producing reactions like that from firing, there being a voluminous serous exudate out of all proportion to the amount of tissue injury from the toxicity of the irritant. These materials have practically the same range of adaptability as firing, but are less effective in that the reaction caused by them cannot be made sufficiently severe and extensive without endangering the superficial structures to which they are applied.

With these facts before us we are in position to consider the question of how firing affects lameness. Lameness in which firing is adaptable as a treatment may be divided into three groups: First, a large group of lamenesses due to simple chronic inflammations of the essential or accessory organs of locomotion in which the inflammations are in the late acute or early chronic stages and in which the effect of the firing is to cause a removal of the inflammatory deposits and a cessation of the original inflammation; second, smaller group, osseus and arthritic in character, in which there is an advanced simple chronic inflammation

with deposits and in which the effect of the firing is a continuation and exacerbation of the inflammation already present until the involved articular surfaces are obliterated; and third, a small group of muscle and nerve atrophies and degenerations in which improvement of local nutritional conditions by vascular stimulation in the area might be of importance in the regeneration of the organ at fault.

In the first group are included all simple inflammations of locomotory structures, in which the inflammation has progressed beyond the acute stage, and in which the ordinary treatments for acute inflammatory processes have failed to produce a resolution. In such cases there is deposited in the tissues inflammatory exudates of a solid character. These are chiefly fibrinous, and their presence, by irritation, produces a physiological aberration, which to the clinician is exhibited as a lameness. Acute inflammations that are not septic and that clear up promptly within ten days to two weeks with or without treatment leave no such deposits. The exudate in such a case is completely removed by liquefaction and solution in the body fluids. The course of the inflammation being short, there is not tissue hyperplasia, and there is a perfect return to normal.

A delayed resolution (beyond the fourteenth day) of an acute inflammation means that these exudates are not removed. They, by their presence, act as local tissue irritants and as etiological factors in the continuation of the inflammation as well as producing functional derangements and lameness. These deposits are within the tissues or upon the surfaces of the synovial membranes. They persist and are augmented by new deposits as the process goes on.

As this stage of delayed resolution of the acute inflammation continues, a tissue change, characterized as a chronic inflammatory process, begins. This consists essentially of the development of scar tissue in the inflamed area. The acute inflammatory exudates are gradually removed by liquefaction by the lytic substances of the body fluids, and the spaces they occupied are filled with this scar tissue. The older the inflammation the more scar tissue there is present and the less exudate in proportion.

Firing has for its chief aim in the treatment of these cases the removal of these solid exudates. It does this by bringing into the inflamed zone a great volume of normal body fluid, which contains the necessary lytic materials for liquefaction of the deposits. The free mobility of the exudate from the firing and its freedom from solids permits it to execute these functions and transport the products away without permanently embarrassing the tissue with its own presence.

Firing has no direct effect upon the scar tissue of the area. It cannot remove nor reduce in amount this pathological element of the lameness. However, by clearing the inflammatory exudates out of the tissues, thus removing the chief source of local irritation, the hyperemia and exudation ceases, and there is a healing. The condition is then known as a healed chronic inflammation. There is no further deposit of exudates, and the production of scar tissue is stopped, but that which is present remains; and, as is characteristic of scar tissue, it contracts as it ages, and to a greater or less extent erases the histological defects and correspondingly the physiological derangement. Thus it is seen, first, that firing in this group of cases has no place as a treatment in the acute stage; second, that its greater sphere of usefulness is in the stage of delayed resolution of the acute inflammation and in the earlier part of the chronic stage; and third, that the benefits derived by the firing of the more advanced chronic cases will vary inversely with the age of the inflammation.

The efficacy of firing on a given case of this kind depends upon certain features of its application. In the first place, the degree of cauterization must be sufficient to produce a maximum of reaction, but without devitalization of the immediately exposed tissues. Secondly, after the acme of the reaction is reached, which is in from four to six days, the care of the fired part must be such that there is a steady and continuous recession of the acute inflammatory phenomena until complete resolution has occurred. It is by this flooding of the area with an abundance of enzyme carrying body fluid and its prompt and complete removal that we hope to get results in this group of cases.

The second group of cases yielding to firing as a treatment includes the long standing pan arthritic inflammations in which the only hope of improvement is in an ankylosis of the involved bones. The purpose of the firing in these cases is diametrically opposite to that in the first group mentioned. Here it is for the purpose of continuing and augmenting the existing inflammation and of encouraging the further hyperplasia of tissue, so that the articulation may be obliterated. The early stages of these inflammations respond to firing as outlined under the first group. Thus a coronary periarthritis, an intermetacarpal ligamentitis or a tarsal arthritis, if detected early and fired, will clean up perfectly and leave no anatomical defects. If allowed to go unchecked the ringbone, splint or spavin will get beyond such possibilities of treatment, and another course must be pursued.

While the technique of application of the treatment is much the same as in the former group, the aim is different. There is not the same necessity of a maximum of reaction, and the longer the inflammation persists the better the results. Point firing is used in these cases as opposed to line firing in the first group, the purposes being better subserved by these methods of application of the cautery.

The third group of cases in which firing may be used is in the non-inflammatory muscle and nerve atrophies and degenerations. We do not recommend firing as being very efficacious in these conditions, but occasionally line firing over the faulty organ, by stimulation of nutritional functions, may be an aid in the treatment.

Patients are fired in the standing position unless they are exceedingly rebellious, in which case they are cast and tied. A hood, a twitch and a side-line are usually sufficient. The area to be fired is clipped and lightly brushed. It should not be shaved, washed, nor severely brushed. It is essential that a covering of hair and epidermis be present, so that the cauterization may be confined to the line or point of contact of the iron and that the interspaces will be partially protected from the heat of radiation. A 10 per cent. cocaine solution is used for anæsthesia. From

three to five minims are injected into the subcutaneous tissue at points two inches apart over the entire field to be fired. After a delay of 10 to 15 minutes to obtain full effect from the cocaine, the patient is restrained and the application of the cautery begun.

For the first and third group of cases as described above the line or feather firing is done. This consists of burning the skin in lines, using for the purpose a suitable copper or iron instrument, which is heated to a degree sufficient to readily char the tissues, but not incinerate them. The lines of firing will leave the least blemish when they are made at right angles to the direction of the lay of the hair or at only a small angle to this line. In firing certain parts, notably the coronet, it is necessary, for best results, to run the lines parallel with the hair direction, although the resulting scar is increased thereby. If the edge of the firing iron be directed slightly upward, so that the depth of the burned incision is parallel with the direction of the hair follicles, the resulting scar will be lessened. The cauterization should extend to the deepest part of the dermis, but should not open into the subcutaneous spaces. Over bony and other prominences it is necessary to use care in this connection, and especially so if the iron be superheated. The lines should be spaced evenly about ⅝ inch apart. For sake of appearance the lines should be parallel and straight. In certain locations diverging lines are permissible. Checked or crossed line firing may also be used in certain areas where the skin will stand a high degree of cauterization.

In firing for a given condition the fired area should extend considerably beyond the border of the diseased area, in order that the reaction shall be sufficient. Suitable designs to cover the surface of the part with lines of correct relation should be formulated. As a maximum reaction is wanted in these cases the cauterization must be as severe as the skin of the part will permit. By a variation in the depth of the lines and a variation in the exposure of the interspace to radiated heat one is able to vary the degree of irritation. Flexor surfaces of joints must not be fired as severely as extensor surfaces; thin skin with a light

coat of hair will not stand as much irritation as a thick skin with a heavier coat of hair. No rules can be laid down for these points in the application of the cautery; judgment and experience is necessary in getting the correct degree of irritation, a degree that will get results without the danger of devitalizing the burned skin.

In the cases of the second group the point firing is used. It is the aim here to allow the point of the cautery to penetrate through the skin and subcutaneum into the periarticular exostoses. It is intended that the firing shall augment the process already present, and most attention is directed to the immediate area of the disease. The fired area is less extensive, relatively, than that in line firing, and the irritation is made especially severe and deep over the diseased tissues, but not at other points. The fired points, for appearance, must be in checked rows, and for best results must be about ¾ inch apart. For the third group of cases line firing is used.

When the firing is completed the area is covered with a vaseline or lard ointment containing a vesicant drug. Usually cantharides is used and in a mixture of 1 to 14 of the menstrum. The patient is then tied in a suitable stall, so that it cannot lie down, nor reach the fired area with its muzzle. It is left so for 48 hours, at the expiration of which time the fired part is washed with warm water and soap to remove the blister ointment and such collections as may have accrued. The area is then allowed to dry and is covered with vaseline or lard or other bland oil. The patient is then turned into a box stall and made more comfortable. Every second day the washing and oiling of the fired part is repeated until the crusts, formed as results of the irritation, are loosened and removed. This takes from twelve to fourteen days. The application of oils is then discontinued and instead the part is subjected to a cold shower two to four times daily. The granulating lines often need applications of mild astringents at this time. As a matter of fact astringent washes may be used as a routine from the time the crusts are removed until the fired lines have completely healed.

The above method has proven to be efficacious as a post firing treatment. It insures a good healing of the cauterized skin and minimizes blemishes, and it assists in the regression of the inflammatory phenomena.

It is a rule with us that at the time the crusts are removed, that is on about the 12th to 14th day, gentle exercise of the patient is begun. This hastens the removal of the edema and promotes recovery from the effects of the firing. This is judiciously increased from day to day, but is never made at all severe.

By the middle of the third or the beginning of the fourth week after firing the acute phenomena attending the process have disappeared. The edema is gone, the lines of firing have healed and the new hair is well started. It is then time to turn the patient out pasturage. I wish to emphasize the importance of this part of the post-operative treatment. It is during this run at pasture that those processes occur, which insure against a continuation or recurrence of the inflammation. The terminal portion of the inflammatory exudates are now removed from the tissues, the scar tissue present becomes well organized and shrinks, and there is a general restoring of the structures to a normal condition. These processes are most active in the fourth and fifth week after firing, but they are not completed until three to six months have elapsed. We have had cases in which the fired structures have improved continuously in appearance, in tone and in function for twelve months after the application of the cautery. Patients do not do nearly so well at this stage if confined in a stable, even though only for part time, and they do very poorly if put to work. The run at pasture should be for not less than two months, and the longer the time the better. The season of the year makes no difference in this rule.

There are but few really important contraindications to firing. In some cases the blemish that follows firing precludes its use in the treatment of lameness in the high-class horses, especially when such disfigurement is distasteful to the owner. We do not under any circumstances fire a neurotomized part. Such a procedure is very apt to result in disastrous trophic disturbances in

the limb. Patients suffering from any acute febrile trouble must not be fired because of the increased danger of skin necrosis under such conditions. It is not an uncommon thing to have patients brought into the hospital to be fired when they are in the incubationary period of an acute, infectious disease and have them develop the disease at the time of the height of the firing reaction. We find this combination an unfortunate one, as each condition is made more severe by the presence of the other.

The subject of complications of firing is a more extensive and important one. Necrosis of the skin of the interspaces is a very common complication. It is always a danger because the operator is anxious in every case to get as high a degree of cauterization as the skin will stand. Skin necrosis is due to the devitalizing action of the heat. Using too hot an instrument, moving the heated iron over the surface too slowly or repeating the cauterization too often usually explains skin necrosis. Considerable experience is necessary to successfully guard against this complication.

The opening of important joint cavities and tendon sheaths is another complication resulting from inexcusable errors on the part of the operator. This is most frequently done with the point iron, but occasionally the careless use of the too hot feather iron will open a bursal cavity. The only areas in which it is permissible to allow the iron to penetrate deeper than the skin are the areas overlying bony, new growths. It is perfectly safe to allow the hot point iron to penetrate into a splint, a spavin, a ringbone or other similar exostoses. Under no conditions, however, must bones, ligaments, tendons or other normal structures be penetrated.

The puncturing of arterial trunks with severe hemorrhage is sometimes a complicating condition. It will not often occur to the careful operator.

Accidents of restraint, injuries to the fired area during progress of the inflammation and infection of the granulating surfaces are some of the less frequent associated conditions. Tetanus and even septicaemia have been recorded as complications.

Mild or even severe laminitis may make its appearance during the course of a firing reaction, especially if more than one limb is fired.

The chief sequel of firing is the blemish left by the healing of the cauterized points or lines. If executed properly, firing leaves but a slight blemish, but if there has been some irregularity in the technique or some complication, the scars may be large and most unsightly. Skin thickenings, contracted and distorted tendons and ligaments and hairless scars are some of the disfigurements that mark the cases of the careless operator.

A Progressive Profession.—Fifty years ago the profession of veterinarian commanded but scant respect in America. The eminent Dr. Alexandre Liautard was then in New York striving to convince the people of the importance of the profession, and scattered here and there was a scientist practicing the profession. For the most part, however, the present great science of veterinary medicine was represented in the United States by "hoss doctors," who held out around livery stables in the towns and villages, told risque stories, would bear watching in horse trades and had a specific for every ill that horse flesh was heir to—which usually killed the animal. At the convention held in New York recently some 1,200 members were in attendance, in which were included many scientists whose achievements have won for them world-wide fame. In many diseases that are common to both animals and humans the scientific veterinarian has by his achievements placed humanity under obligations to his profession.

The above complimentary comment upon our profession clipped from *The Country Review*, published in Baton Rouge, La., appeared while our friend Dr. Dalrymple was in New York, and was spontaneous in the heart of the editor of that paper.—[Ed.]

The Cost of Milk Production.—Bulletin No. 145, giving information relative to the cost of milk production has just been issued by the Massachusetts Experiment Station. It gives the cost of the food consumed by each cow in the station herd from 1896 through 1911, the estimated cost of caring for the cow and the cost to the farmer of a quart of milk. Data are also cited from other sources bearing on the cost of production. Five suggestions are made to dairymen and the place of dairying in the agriculture of the State is briefly discussed.

The bulletin may be secured by addressing the Director, Massachusetts Agricultural Experiment Station, Amherst, Mass.

REPORT OF THE SPECIAL COMMITTEE FOR THE DETECTION OF GLANDERS.*

By E. B. Ackerman, Adolph Eichhorn, Charles E. Cotton, C. D. McGilvray, John Reichel and Charles Keane.

At the 49th annual meeting of the American Veterinary Medical Association by a " motion duly seconded and passed it was voted to recommend to the association that the incoming president appoint a committee to investigate modern diagnostic methods for the detection of glanders and reach an understanding as to the best method for the reduction of glanders."

After a meeting of three of the members of the committee, February 15, 1913. it was decided to adopt the following outline, in the manner in which the sudy of the disease glanders may be fully covered:

Glanders:

1. Cause, Variation in Virulence.
2. Animals Susceptible.
3. Period of Incubation.
4. Modes of Infection.
5. Manifestations, Symptoms, Prognosis.
6. Diagnosis: Mallein-Subcutaneous, Ophthalmic, Cutaneous, Laboratory, Cultural, Animal Inoculation Test, Blood Test, Opsonin, Conglutination, Precipitation, Agglutination, Complement Fixation.
7. Differential Diagnosis—Clinical, Laboratory.
8. Pathological Anatomy.
9. Quarantine—Clinical, Occult and Exposed Cases.
10. Disposition—Clinical, Occult and Exposed Cases.
11. Treatment.

* Presented to the Fiftieth Anniversary Meeting of the American Veterinary Medical Association at New York, September, 1913.

12. Disinfection.
13. Retesting and Subsequent Control.
14. Regulations, State and Federal.

The committee understood that its duties were to be confined to the study of the modern diagnostic methods and reach an understanding as to the best method for the reduction of glanders.

Prior to the discovery of the bacillus mallei as the specific cause of glanders by Loeffler and Schutz, in 1882, the diagnosis rested entirely upon clinical observations. The symptoms of the disease are perhaps better differentiated at this time, but in the main the general picture of the clinical case is unchanged.

Since then more tests and methods of more or less diagnostic value have revealed themselves than in any other infectious disease of animals, which may be tabulated as follows:

1. *Clinical Diagnosis.*

2. Mallein Tests. A—Subcutaneous Mallein Test; B—Ophthalmic Mallein Test; C—Cutaneous Mallein Test: 1. Cutaneous, 2. Dermal, 3. Endermal.

3. Laboratory Diagnostic Methods. A—*Examination of Pus or Nasal Discharge:* 1. Microscopic, 2. Cultural, 3. Animal Inoculation Test; B—*Examination of Blood:* 1. Opsonin, Conglutination or Precipitation Test, 2. Agglutination Test, 3. Complement Fixation Test.

1. *Clinical Diagnosis.* Without going into details the cardinal manifestations may be enumerated as follows: Characteristic nasal discharge; nodule or ulceration; enlargement of submaxillary glands; cording of the lymphatics and fluctuation in temperature range.

2. *Mallein Tests.* Mallein, the toxic substances produced in cultures of the bacillus mallei, was discovered by Hellman and Kalning in 1891. Pearson, working independently, prepared mallein and further proved that mallein, like tuberculin, produces a temperature rise in sensitized, infected animals.

In that the preparation of mallein varies greatly and the final product differs considerably, it is suggested that the name mal-

lein, like tuberculin, abortin and kindred preparations, be reserved to the final product obtained in the following way: One or more highly virulent strains that will produce an orchitis in a guinea pig in 24 hours following intraperitoneal injection and death in 14 days following subcutaneous injection, transferred to + 1.5 glycerin peptone bouillon and incubated no less than 6 weeks at 37° C.

The purity of the cultures and virulence of the strains should be proved before sterilizing the glycerin peptone bouillon cultures. After filtering out the killed bacilli and determining the exact volume of the filtrate, the filtrate concentrated to one-tenth its original volume over a water bath represents *concentrated mallein* or *mallein.*

Mallein solution as used in the subcutaneous test is mallein diluted with 0.5 per cent. carbolized salt solution.

Precipitated or purified mallein is the dry powder obtained from mallein, precipitated with many volumes of absolute alcohol. After filtering out the precipitate, redissolving in normal salt solution and washing repeatedly with alcohol (absolute) the precipitate is finally dried over calcium chloride or sulphuric acid. A 5 per cent. solution is generally used.

The mallein prepared of any one or more strains of bacillus mallei should be tried out on sensitized animals before it is relied upon in actual tests.

Even though the exact composition of the active principle of mallein remains unknown, the specificity of the reaction in sensitized animals is established beyond question.

Subcutaneous Mallein Test. This is the oldest of the mallein tests, is reliable when properly carried out and interpreted. It consists of the injection of mallein solution, which in sensitized animals will produce characteristic temperature rise, local and general reaction.

A characteristic temperature rise begins in from 4 to 8 hours, and the maximum temperature is reached in from 10 to 20 hours, with a gradual return to normal.

At least two temperatures should be taken before the injec-

tion of mallein solution 3 hours apart and five temperatures after the injection beginning not later than the tenth hour and continuing to the twentieth hour at intervals of not less than 2 hours.

The least difference between the before and after temperature should be 2.5° F., with the temperature rising to 103° F. or above.

Local Reaction. Several hours after injection a hot, painful, œdematous swelling develops, which may persist for several days, enlarging considerably and gradually disappearing.

Normal horses may show a local swelling which will not enlarge and rapidly disappears.

General Reaction. Lessened appetite, dullness, staring coat, muscle tremors, respiratory difficulties, altered pulse rate, all of which may or may not be present.

Ophthalmic Mallein Reaction. This test has the advantage in that it is simple and easy to apply.

Application of Test. A—Before applying the test, examine the eye for conjunctivitis or purulent change. Should a conjunctivitis exist, the eye test should not be tried.

B—Take temperatures before the ophthalmic test. Fever need not hinder the test.

C—Place 4 to 5 drops (0.1 to 0.2 for one test) of undiluted mallein or 5 per cent. solution of precipitated mallein within the lower eyelid with a dropper, glass rod, or camel's-hair brush. The other eye is left untouched to serve as control. Same brush or glass rod may be used from animal to animal.

D—As soon as the mallein is applied, a flow of tears nearly always appears with reddening of the conjunctiva and photophobia. These phenomena have no significance and disappear in several hours.

E—The characteristic manifestations of a positive reaction begin 5 to 6 hours and last 36 to 48 hours, sometimes longer. *A purulent secretion or discharge with reddening of the conjunctiva alone is significant of a positive reaction.* Swelling and gluing of eyelids may be seen in severe reactions.

F—The eye should be examined and compared in good light

16 to 18 hours after the application of the test. The conjunctiva and the eyeball should also be included in the examination after noting the discharge.

Generally the positive reaction is not accompanied by temperature rise or general reaction. The temperature variation does not occur in negative tests or normal animals. In positive reactions the rise may be observed in taking the temperature twice, the first time when the test is applied, and the second when the readings are made 16 to 18 hours later.

G—The results of the test to be interpreted and recorded as follows:

1—Negative, N, Eye unchanged.

2—Suspicious, S. Sero-Mucous Discharge.

3—Positive, P + Sero-Mucous Discharge with purulent flakes.

4—Positive, P + + Distinct purulent discharge.

5—Positive, P + + + A purulent discharge with swelling of the lower eyelid.

6—Positive, P + + + + Strong purulent discharge with gluing together of both lids.

H—If the result of the test is negative or questionable 24 hours after the first application the test may be repeated at once on same eye or the control eye. If repetition is also negative or questionable the test may be repeated in three weeks.

I—The intensity of the ophthalmic reaction bears no relation to the stage or development of the infection.

Cutaneous Mallein Test. In the cutaneous dermo-endermal mallein tests the concentrated mallein is applied with a knife or vaccination needle; rubbed into a shaved area or injected into the skin. In the latter test a highly diluted mallein is used in preference to a concentrated mallein.

In positive case a spreading, warm, painful and oedematous swelling will be observed in 24 hours.

The reactions are positive when the distinct visible swellings in contrast to the unaffected control areas develop. In severe reactions vesicular eruptions may appear.

In that the skin tests are complicated, requiring special instruments, skill and practice, they are not considered practical.

Laboratory Diagnostic Methods. The demonstration of the organism in smears in the microscopic examination and the isolation of the organism culturally—or the demonstration of the infection in the injection of the suspected material into a male guinea pig resulting in a typical Strauss reaction is positive evidence of the disease, but the absence of these findings or negative animal inoculation tests does not warrant a negative diagnosis.

Examination of Serum. 1—Opsonin, conglutination or precipitation tests. The first have proved laborious and impracticable, and the latter unreliable.

2—Agglutination test.

Depends upon the power of undiluted immune serum to clump bacteria suspended in carbolized salt solution. The presence of agglutinins is determined quantitatively in using measured amounts of serum and test fluid.

Readings to be made after incubating the tubes for ½ hour at 37° C. centrifugalizing at 1,600 revolutions for 10 minutes and allowing tubes to stand at room temperature for 2 hours.

The same result may be obtained in allowing the tubes to incubate at 37° C. for 24 hours and to stand at room temperature for 12 hours more.

The appearance of a veil-like membrane with turned-in edges or small clumps or flakes of grayish white or brownish at the bottom of the tube may be regarded as positive agglutination.

Sharply circumscribed sediment in the center of the tube with shape of lentil seeds indicated the absence of agglutination in centrifugalized tubes.

The agglutination value of over 1—1000— is indicative of glanders, but since high agglutination titres were obtained only in the acute form of the disease, it is advisable to combine this test with the complement fixation test and not make the diagnosis on this test alone.

Complement Fixation Test. This is the most complicated of

the tests and must be considered purely a laboratory diagnostic method requiring careful technique. Like the agglutination test, it is a quantitative reaction in which the affinity of the immune bodies in the serum of an affected animal to the glanders antigen is utilized for the phenomena of the reaction in which the following play a part: Complement = normal guinea pig serum; sheep rabbit amboceptor = sensitized rabbit serum with washed red blood corpuscles of sheep; glanders antigen = shake extract of killed glanders bacilli; sheep corpuscles and the clear serum of the suspected animal.

The results of the test should be interpreted as follows:

1—Horses in which the serum produces a complete fixation of the complement in the quantities 0.1 c.c. and 0.2 c.c. should be considered as glandered.

2—Horses in which the serum gives a complete fixation in the quantity of 0.2 c.c. and an incomplete fixation in the quantity of 0.1 c.c. should likewise be considered as glandered.

3—Horses in which the serum produces an incomplete fixation of the complement in the quantities of 0.1 c.c. and 0.2 c.c. should also be considered glandered.

4—Horses in which the serum shows no fixation of the complement in either tube should be considered free of glanders.

The value of any diagnostic method cannot be accurately estimated or judged, unless autopsies are made by a carefully trained veterinarian of all animals tested that die or are destroyed. Macroscopic examinations are not sufficient with the presence of atypical lesions.

Unless typical lesions are present, histological and bacteriological examinations must be resorted to.

In deciding upon a method which would be most satisfactory for the diagnosis of glanders, the simplicity, reliability and trustworthiness of the method must be above reproach.

The results should manifest themselves as soon as possible, the reaction should be well marked and distinct and easily applicable by the average practicing veterinarian.

A test with these requirements places a test into the hands

of the practicing veterinarian along with which the standing of the veterinarian in the community and the confidence of the public to the veterinarian is brought into closer relationship, in that it enables the veterinarian to personally decide on the results of the test.

The ophthalmic test not only meets all these requirements, but is without doubt the most convenient diagnostic method at our command.

Is reliability compares favorably with any of the other available tests.

The reaction is usually distinct, and doubtful or atypical reactions are rather infrequent.

The ophthalmic test does not interfere with subsequent serum or other mallein tests if such are deemed necessary.

The test may be repeated within 24 hours on same or control eye, and final retest in not less than three weeks.

The ophthalmic test should be recognized by state and federal authorities, since its reliability can no longer be doubted.

In all atypical and doubtful cases of the ophthalmic test the combined complement fixation and agglutination or subcutaneous mallein tests should be utilized for confirmation. Such a procedure should minimize the failures and assure the best results in the control of the disease in a single stable or in an entire community.

Appearance of the Reaction of the Various Tests after Infection.

Agglutinins reach their appearance in from 4 to 5 days and continue to increase in the early stages of the disease and diminish as the disease becomes chronic.

Specific amboceptors of the complement fixation test may be demonstrated in from 7 to 10 days in quantities of diagnostic value, and their presence may be demonstrated during the entire course of the disease.

Subcutaneous mallein test may, as a rule, be relied upon 15 days after infection.

Ophthalmic mallein test may be relied upon 3 weeks after infection.

Effect of One Test on the Others. All blood serum tests are influenced in 3 to 6 days after a subcutaneous injection of mallein or any glanders antigen, including glanders vaccines, for a period varying from 6 to 8 weeks following injection of mallein and up to 3 months and even longer following injection of glanders antigen or vaccines. All blood samples therefore should be taken prior to or at the time of the mallein injections.

The subcutaneous mallein test or injection of glanders antigen and vaccines may influence the ophthalmic mallein test. The ophthalmic mallein test should therefore be withheld for 30 days after application of the subcutaneous mallein.

Control. In the reduction of glanders all clinical cases should be immediately destroyed. All suspected and exposed animals should be tested and the positive reactors destroyed. The remaining contact horses held under restrictions subject to further test after the expiration of at least 15 days. All infected premises should be thoroughly cleansed and disinfected.

All interstate movements of horses, mules and asses should be regulated to include proper testing for glanders by the state or federal governments.

Compensation for clinical and occult cases should be provided for.

As this committee was obliged to confine its efforts to only a part of the outline of the proper consideration of the disease glanders in its entirety, we respectfully recommend for your consideration the advisability of the appointment of a permanent committee or commission to consider the subject as outlined in the beginning of the report submitted herewith.

A MANY-SIDED VETERINARIAN.—Our esteemed collaborator, Dr. W. H. Dalrymple, of Baton Rouge, La., has appeared in many roles during our long and cherished acquaintance with him; but he seems not to have exhausted his *repertoire*, as we find him representing the Baton Rouge Chamber of Commerce at an Immigration Conference in New York on September 17th and 18th.

SANITARY POLICE MEASURES AND HOG CHOLERA.*

By A. T. Kinsley, M.Sc., D.V.S., Pathology, Kansas City Veterinary College.

Statements in this paper refer primarily to the principal hog producing states; that is, to local conditions in particular, but they will also probably be applicable to the entire United States, and in a general way to Canada and all other foreign countries.

It is not the purpose in this paper to enter into the pathology of this disease, but to briefly discuss some of our laws controlling the movement and quarantining of cholera hogs.

Hog cholera probably first made its appearance in the United States in 1833 in the state of Ohio, and since that time it has become widespread throughout the entire hog raising section of this country. From reports it is evident that every state in the union has suffered losses from hog cholera.

The extent of the losses in 1912 from hog cholera, in Iowa, Nebraska, Kansas and Missouri, exceeded three million hogs, with an estimated value of over thirty million dollars. The total losses in the United States for 1912 approximated one hundred million dollars. So far as can be determined from available statistics the relative losses both in the number of hogs and their value has never exceeded or been equal to the losses of 1912, and these extensive losses have occurred regardless of the fact that large quantities of anti-hog-cholera serum had been used.

When pressed for a reason for the stupendous loss of hogs during the past year, it must be admitted that there has been some serious defect in our methods of control of this disease.

Hog cholera is now prevailing extensively in the four states above mentioned and is quite generally distributed in all the states of the Mississippi valley. It is probable that the losses

* Presented to the fiftieth anniversary meeting of the American Veterinary Medical Association at New York, September, 1913.

for 1913 will be far in excess of those for 1912, unless some radical changes are inaugurated and enforced in the methods of control of this disease.

Practically every state has some law or regulations providing for the control of hog cholera, and during the past year many states passed new and stringent laws, some of which should be efficient and if properly enforced will materially diminish the losses at once and ultimately will eliminate hog cholera from those states.

Nebraska has no quarantine regulations or restrictions for the movement of cholera hogs. Iowa has a regulation requiring the immunization of exhibition hogs, and a clause quarantining all hogs immunized by the simultaneous method for thirty days, and the premises where hogs have been simultaneously immunized for six months. Missouri provides for burying or burning of carcasses of hogs dead of cholera, and has recently made provision for a three weeks' quarantine and simultaneous immunization of feeders. Minnesota has a provision requiring burning or burying of hog cholera carcasses, a provision permitting quarantining of affected herds, and a provision requiring the disease to be reported to the Sanitary Commission. Indiana permits removal of hogs showing no symptoms, from infected pens, providing vehicle of transportation does not scatter litter, and that when hogs are unloaded, all litter from the carrying vehicle is burned, and further, provided that the hogs are slaughtered where there is B. A. I. inspection. Another clause prohibits the sale of hogs for four weeks after virus has been used. Feeders may be purchased, providing they be given the serum treatment within forty-eight hours after their arrival. A very important clause provides for the report of the prevalence of hog cholera, by all licensed veterinarians, failure to do so being sufficient cause for revocation of their license. Kentucky provides for burying or burning carcasses of hogs dead of cholera, and the immunization of exhibition hogs. Tennessee has a peculiar provision regulating the disposal of the carcasses of hogs dead of cholera, it provides that the carcasses be burned or sent

to a rendering tank. They have a general law requiring the notification of the health board of any and all communicable diseases of domestic animals. Georgia prohibits the sale for slaughtering, breeding or feeding of hogs affected with cholera, or hogs from infected pens.

Practically all of the foregoing states have general laws relative to infective diseases, but in nearly every state hog cholera has not been considered in the same relation as infective diseases of other animals. Presumably, every state and country, in accordance with general sanitary laws, prohibits the shipping of cholera-infected hogs to market, but it has been self-evident that hundreds and thousands of cholera hogs are transported to our markets every year, and thus far, without any noticeable remonstrance from the sanitary authorities. It is very evident that hog cholera will prevail as an epizootic as long as the producer is permitted to load and ship cholera hogs to market, for such procedure provides means of distributing infection throughout the country.

A few states have quarantine regulations relating to premises and hogs infected with cholera, but it is doubtful if any state actually quarantines cholera hogs. This is a serious mistake and must be overcome if this disease is ever controlled.

Previous to the use of anti-hog-cholera serum it was possible to control this disease so that the losses rarely exceeded 90 per cent., and in many instances 80 to 90 per cent. of the hogs in infected herds could be saved. The disease can be prevented from extending to the neighboring premises through a rigid enforcement of quarantine regulations.

A difficult problem in the control of any infective disease is obtaining the knowledge of the existence of the disease before it becomes widespread. In order that a disease be reported, each commonwealth should be divided into districts or units, and in most of the states a county could be designated as a unit. Each unit should have a county veterinarian whose duty should be the investigation of reported outbreaks. A further provision should require the producer to report any disease of his domestic

animals to the county veterinarian, who in turn should investigate and report to the proper state official. Every state should further provide for the reporting of all infectious diseases observed by graduate veterinarians to the respective health official, either county or state. If these regulations, which would probably vary somewhat in different states, were concisely prepared, duly published and rigidly enforced, the producers would show their appreciation by complying in every detail.

Just recently the writer visited a section of the country along the Iowa-Missouri border. No hog cholera had been reported in this particular section for several years, although it had occurred in some herds within ten miles of this community in 1912. One man had about two hundred hogs and lived on the Missouri side of the state line. His hogs began to die in March or April, and up to the 20th of July about one hundred and eighty had succumbed to the disease. This man did not inform any one that his hogs were affected until they were practically all dead, and when confronted with the seriousness of the lack of proper control, he contended that the disease was not hog cholera. The carcasses had been disposed of by covering them in gullies and ditches on his premises. Three neighbors whose farms are so situated that they receive drainage from the infected pens, now have hog cholera in their herds, and the losses will be extensive. If a rigid quarantine had been enforced early in the outbreak and the carcasses properly disposed of, the disease would probably have been confined to the one premise.

The proper disposal of carcasses of hogs dead of cholera is of very great importance in the control of this disease, because of the prevalence of carnivorous animals in all rural communities. Dogs, cats, fowls and various wild animals and birds consume freely of the carcasses of animals, and are no doubt a very important factor in the spread of communicable diseases. The fact that the virus maintains vitality in the surface soil and in the carcass for a considerable time should be sufficient evidence to warrant the proper disposal of carcasses of cholera hogs. In many communities in Missouri, Iowa, Nebraska and Kansas,

in 1912, one could see the carcasses of hogs strewn in ravines, by-ways and highways, and railroad right of ways, and even in the alleys and streets of the smaller towns. Such miscellaneous sowing of virus, no doubt, is in part responsible for the prevalence of hog cholera at the present time.

Another modern method of spreading hog cholera has been by the improper use of the virus in the simultaneous immunization of hogs against cholera. Even when the virus is used judiciously, in the simultaneous immunization an occasional hog dies of cholera. It is very evident that the virus would exist in the carcass of such a hog. It is also possible that the virus is eliminated before death from fatally diseased hogs, and if hog cholera is similar to many of the other infective diseases, the virus is eliminated from the simultaneously immunized hogs, even though they do not die of the disease. It is, therefore, an undisputed fact that many new centers of hog cholera have had their origin from the sowing of the disease by the use of virus immunization. The quarantining of all hogs for a period of four weeks, and quarantining the premises for six months where said hogs were immunized, as required by the regulations in Iowa, is the only safe procedure where the virus is permitted to be used.

In conclusion it is evident that the various states in the principal hog raising section of the United States have either insufficient laws for the efficient control of hog cholera or the sanitary authorities of said states are not enforcing the laws controlling hog cholera in a manner to obtain results that should be obtained. Further, it is the opinion of the writer that if laws and regulations were provided and enforced, first, prohibiting shipping of cholera hogs, second, providing strict quarantine of infected premises, and the proepr disposal of the carcasses of hogs dead of cholera, and third, effectually controlling the distribution and use of virus; the losses from hog cholera could be reduced fully 50 per cent. without the use of any anti-hog-cholera serum and 90 per cent. by combining police control measures and the judicious use of serum.

THERAPEUTICS OF PARENCHYMATOUS MASTITIS.*

By Louis A. Klein, University of Pennsylvania.

The pathological alterations of parenchymatous mastitis show a striking similarity to those of pneumonia. There is an exudation of blood serum and an immigration of leucocytes and wandering connective tissue cells into the acini and ducts of the gland, which is accompanied by an exfoliation of the epithelial cells lining the asini and ducts. There is also an inflammatory exudate into the interstitial and subcutaneous connective tissue, which is sometimes very pronounced. If these exudates can be removed and the epithelium is capable of regeneration, resolution occurs. If the exudates are not removed and the circulation is not restored to normal within a certain period, the inflammatory process in the interstitial tissue assumes a productive character. An increase of the interstitial connective tissue occurs and the udder becomes indurated. Subsequently, the newly-formed connective tissue contracts and produces atrophy. The epithelial cells disappear in such cases, either as a result of the pressure from the contracting connective tissue or because of extensive destruction at the beginning of the disease. If the milk ducts or canals are obstructed by clumps of casein or fibrin, the pathological secretion will be dammed up and abscesses will form. If the circulation is cut off from a section of the inflamed area by thrombosis or by pressure from the inflammatory exudate or collections of pus, necrosis or gangrene will occur. The necrosed area is subsequently separated from the healthy tissue by suppuration and may then become encapsulated, or, as occurs more frequently, the line of demarcation may extend to the surface, when the sequestrum may be eliminated spontaneously or removed by operation.

* Presented to the fiftieth anniversary meeting of the American Veterinary Medical Association, at New York, September, 1913.

Resolution and the avoidance of complications, it will be seen, depend upon the prompt removal of the exudates. The exudate in the acini, ducts and cistern can be drawn off by milking, but that in the interstitial tissues must be resorbed.

Resorption is a complex physiological process which cannot be generated by artificial means, but the natural processes concerned can be stimulated or increased in capacity by certain therapeutic methods. The principal factors concerned in resorption are the interchange of fluids between the blood and tissues, the leucocytes, and the quantity of blood flowing through the part. By utilizing these natural forces resorption can be promoted.

Purgatives and diuretics increase the interchange of fluids between the blood and tissues. By causing a reduction in the fluid of the blood they cause fluid to be absorbed from the tissues. This is known as the derivative or revulsive method. Sialagogues and diaphroetics also produce a derivative effect. The most striking illustration of the effectiveness of this method is the result obtained from the use subcutaneously of arecoline, a purgative and sialagogue, in the treatment of laminitis in horses. In parenchymatous mastitis, it is customary to use magnesium sulphate as a purgative but eserine and pilocarpine combined act more promptly and perhaps more thoroughly and effectively, since they are sialagogues as well as purgatives, although their cost may prohibit their use in some cases. Arecoline is not recommended for cattle. On account of their weakening effects, purgatives canot be repeated, but the derivative action can be continued by the use of diuretics. Potassium nitrate is a very popular diuretic in the treatment of parenchymatous mastitis but one of the less irritant saline diuretics would be more desirable. Phytolacca, which has been used empirically in the treatment of mastitis for a long time, has a diuretic action and no doubt exerts its effects in this way. Diaphoretics are of no practical value as derivatives in cattle practice.

Leucocytes assist in resorption by phagocytosis and by causing the disintegration and solution of solid exudates by means of a ferment. Leucocytosis may be increased by the local applica-

tion of stimulants, such as tincture of iodine, spirits of camphor, oil of turpentine, etc., and by other measures which increase the flow of blood to the part, as hot water bathing, vapor baths, Priessnitz dressing, poultices, plasters, frequent milking and massage. According to Hess, massage should only be used after the inflammation has begun to subside and pain has disappeared. If it is applied at the height of the inflammatory process the disease will be extended to the adjoining quarter on the same side or on the opposite side and the secondary infection is usually more severe and more difficult to heal than the original process. Massage is also contraindicated when suppuration or necrosis is present. The phagocytic function of the leucocytes can be stimulated by the injection of bacterins, but this action is a specific one and the bacterin is only effective for the particular species of organisms used in its preparation. Since parenchymatous mastitis is a polybacterial disease the preparation or selection of a suitable bacteria for each case would involve considerable detail work. Schmidt, of Kolding, Denmark, the discoverer of the successful modern treatment for milk fever, recommends as a substitute for bacterins the infusion into the udder of equal parts of absolute alcohol and glycerine. This mixture, he says, will kill and dissolve numbers of the bacteria concerned in the disease and when these dissolved substances are absorbed specific opsonins will be produced which will stimulate the phagocytic action of the leucocytes against the bacteria remaining in the udder. But the mixture has a destructive action upon the epithelium of the udder and for this reason can only be used in those severe cases where the life of the animal is threatened or where there is no prospect of the return of the milk secretion. In other cases, the mixture is diluted with an equal amount of physiological salt solution. Usually about 250 c. c. is infused into the infected quarter and the quarter is not milked out for three days. The disintegrating and solvent action of the leucocytes on solid exudates cannot be directly affected by drugs but a similar action can be obtained with potassium iodide, which destroys pathological cells and causes them to degenerate,

and by sodium chloride, sodium bicarbonate, sodium sulphate and ammonium chloride, which dissolve and liquify solid inflammatory products.

An increased flow of blood through the part may be brought about by heart stimulants, local stimulant applications, hot water bathing, vapor baths, Priessnitz dressing, plasters, poultices, massage and frequent milking. Caffeine will serve the purpose of both a heart stimulant and diuretic and may be given in the form of the alkaloid or strong coffee. Frequent milking, every one or two hours, is a very important method of treatment. The manipulation of the test dilates reflexly the blood vessels of the udder and causes a greatly increased amount of blood to flow through the udder. It also removes the exudate and prevents its decomposition and the formation of irritant bacterial products in the acini and ducts of the udder. A suspensory bandage promotes the circulation in the udder and also reduces pain by relieving tension upon the tissues.

When it was demonstrated in the last quarter of the nineteenth century that bacteria were the direct cause of mastitis, Franck advocated that the disease be treated by destroying the bacteria concerned by the injection of antiseptics into the udder. This method of treatment was adopted by many veterinarians, but the results were disappointing. It was found that the antiseptic solutions irritate the udder tissue and frequently increase the inflammation even when diluted to a point where their effectiveness seems doubtful. Subsequently it was observed that all of the beneficial effects resulting from the injection of antiseptic solutions could be obtained by frequent milking without the irritation produced by antiseptics.

Some antiseptics when administered by the mouth are eliminated through the udder. The writer administered hexamethylenamina better known under the name of urotropin, to a cow in one to two dram doses and demonstrated formaldehyde in the milk in twenty-four hours. Boric acid given in two to six dram doses at the same time to the same animal appeared in the milk in twelve hours. No irritant effects were produced. Iodine is

eliminated in the milk when potassium iodide is given and salicylic acid is also excreted through the udder. When doses of 45 grains to 1½ drams of potassium iodide were given daily, Labourdette found that the milk contained up to 3¾ grains of potassium iodide to the quart. The amount of the other substances eliminated in the milk has not been determined.

The germicidal power of milk, which is feeble under normal conditions, is increased in mastitis. Its effect on the bacteria of mastitis has not been accurately tested but the writer has observed a few cases of streptococcic mastitis in which it appeared to have destroyed the organisms of the disease. Whatever advantage can be obtained from this property can be exerted to the fullest extent by frequent milking of the affected quarter.

While bacteria are usually the direct cause of mastitis there are certain accessory or predisposing causes which should receive consideration in treating the disease. These are damp, cold floors, sudden exposure to cold air, excessive cold, drafts, incomplete milking and stasis of milk. Deep milkers are more susceptible to the disease than others.

Usually the fever is reduced by the action of the purgative and the diuretics. Very high temperature indicates septic infection and camphor, alcohol and quinine are then indicated. Necrosis, abscess formation, indigestion, paresis of the rumen, muscular weakness, posterior paralysis and other complication are treated according to the usual methods.

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Miss Alice Lilly Bridge Palmer arrived at the home of Dr. and Mrs. C. B. Palmer, Easton, Pennsylvania, on October 19, 1913. The young lady seemed in excellent spirits and weighed 7¾ pounds at the time of her arrival.

ARTIFICIAL INSEMINATION AND ITS RELATION TO THE VETERINARIAN.*

By Dr. F. F. Brown, Kansas City, Mo.

The merits of artificial insemination of animals has been given but very little attention by the veterinary profession as a whole. Until recently this method of impregnating animals has never been utilized in a general way, but has been restricted to a limited number of valuable females having some congenital defect or pathologic condition.

Perhaps one of the greatest reasons for lack of interest in this subject on the part of veterinarians is their lack of knowledge or appreciation of the practical adaptability of the method to daily breeding operations.

Doubtless the schools engaged in teaching veterinary science are in a great measure responsible for this lack of knowledge. The individuals composing the faculties are not ordinarily engaged in active practice in breeding districts, so that the importance of this method has not fully impressed them.

It is to be regretted that students and graduates go from the doors of our colleges uninformed on this important branch of veterinary science. I seriously question if there is a single standard school that gives the subject more than passing notice and perhaps then with the impression that it is only of experimental interest.

With the belief that our profession is not fully awake to the importance of this subject the writer has been prompted to the preparation of this paper.

Progress is being rapidly made in this work, not by veterina-

* Presented to the fiftieth anniversary meeting of the American Veterinary Medical Association at New York, September, 1913.

rians, but by laymen, and it should not be for us to stand idly by and see ourselves outstripped by men untrained in a branch of work that is properly ours.

Laymen have developed the practice of artificial insemination to a point where it has been placed upon a practicable basis and may be generally utilized in daily breeding operations in the equine. By experience the stallioner has learned that the services of his animal may be extended manyfold by this method, and that the energies of the sire may be conserved and not overtaxed and that the number of progeny possible from a sire during his lifetime is almost incalculable.

Relying upon the physiologic fact that but a single spermatozoon is necessary for successful fecundation, and that hundreds of thousands are lost at each service, it suggests itself to the thinking man that numerous divisions may be made, so that several mares may be bred just as effectively as the usual single individual.

The technique must surely be simple if laymen with but little training can practice this method successfully. Observance of cleanliness with attention to proper temperature and avoidance of exposure to bright sunlight are some of the requisites for success.

Artificial insemination in the hands of careful, observing men is rapidly becoming an important commercial proposition. No man can predict its influence on the future production of animals.

A statement can only be made of what is already being accomplished with a hint as to its possibilities for the future.

These statements are based upon personal experience and extensive inquiries made to reputable breeders engaged in practicing artificial insemination from one to five years. I have in my possession upwards of 160 letters from breeders in answer to questions submitted to them, and from the various sources of information the following conclusions have been reached concerning the advantages of artificial insemination over natural service.

1st—Stallion owners are able to restrict the services of their

animals to one period a day, thus conserving the virility of the sire and contributing to more vigorous offspring.

2d—By effecting a division of the semen from 7 to 18 mares may be easily bred from a single service.

3d—That a higher percentage of foals results for the reason that insemination is certain and the stallioner soon learns to detect and reject mares showing evidence of confirmed sterility.

4th—That impregnation is far more certain in case of atresia of the cervix, a tortuous or elongated cervical canal, together with various pathologic conditions of the vaginal tract and numerous other conditions.

5th—The opportunity for conveying contagious or infectious genital diseases is greatly lessened and reduced to the minimum by the observing operator.

6th—That the opportunity for physical injuries to either stallion or mare is practically nil by this method.

7th—That the offspring are equal to and generally should be superior to the natural product on account of the sire not being overtaxed.

8th—That the results obtained justify the stallioner reducing the service fee if necessary, making it no excuse for any man to breed to a scrub and putting the latter out of existence through competition alone.

9th—That certain shy breeding mares may be bred successfully at the termination of the estral period and in the hands of several experienced men impregnations have been accomplished by breeding at any period without regard to estrum.

10th—That with proper care semen may be transported distances and impregnations successfully made.

11th—That cheap females may be utilized as in case of the burro which when crossed with a horse of proper type results in a hinney that finds a ready market at a remunerative figure.

Breeders report that by this method they are able to breed daily all the mares that are presented and several have reported breeding nearly 300 to one sire during the season, with the comment that they could have bred twice the number.

The man who interests himself in artificial insemination will naturally become a student of those conditions responsible for sterility, some of which he may be able to overcome, and others he will reject, thus giving rise to a higher percentage of foals. Instead of the usual 50 or 60 per cent., careful breeders are getting 80 to 90 per cent. and even better by this method. A breeder in charge of a large establishment reports that in 1912 he rejected 136 and in 1913 231 mares as unsuited for breeding on account of clinical evidence of confirmed sterility.

The yearly losses to mare owners that accrue from sterility are enormous.

Many of these cases are victims of genital diseases capable of being transmitted by coition. An examination of the discharges from the uterus of a certain class of sterile mares will reveal a peculiar organism that is capable in cultures of very promptly destroying the life of spermatozoa. The same statement will apply to the discharge itself. Infectious abortion is unquestionably disseminated through the act of coition, and this disease is assuming alarming proportions in some localities.

Every public breeding establishment is in a sense a menace to animal health through the spread of communicable diseases of a genital character, and the owners of these establishments bear a certain relationship and responsibility to the public. This is a vital question affecting the horse-breeding industry, and its proper solution is not easy. The time will perhaps be when these men will have to show proficiency in detecting communicable diseases if sanitary sentiment keeps the pace it is now traveling. In the meantime artificial insemination can be utilized to evade these disorders and is being done by the more progressive breeders.

With a better knowledge of the biology of spermatozoa we are learning to surround them with such environment as will properly sustain and prolong their life. The feat of transporting semen distances for the purpose of insemination has been successfully accomplished for a sufficient number of times to demonstrate its practicability as a breeding measure. Breeders have

repeatedly carried semen 25 and 30 miles to ranches and have successfully impregnated mares. A breeder at St. Joseph last season made a service and six hours later a mare was bred in Omaha resulting in impregnation. It is not beyond the range of reason or possibility for men trained and equipped to make numerous artificial services at points over a wide territory adjacent to their breeding establishment without ever taking the stallion off the premises.

When we consider that a three to five-dollar burro can be made to produce a forty to sixty-dollar hinney at weaning time by this method one can gain a slight insight into the possibilities of what can be attained by artificial insemination.

The brief references and hints made are not founded on dreams or air castles, but are gleaned from personal experience, and those of reputable breeders. The feeling obtains that this subject has been woefully neglected by our profession and that the breeders of to-day are working out these problems without veterinary aid because the veterinarians as a whole have given the subject very little consideration. Here is a great scientific field almost wholly neglected, needing the combined attention of pathologist, bacteriologist, and practitioner, whose united investigations would unquestionably reveal a multitude of truths that yet lie deeply buried in mystery.

About the Photographs Taken at A. V. M. A. Meeting in New York in September—The Review office has been deluged with inquiries in regard to a group photograph taken on the roof of the Hotel Astor during the meeting of the A. V. M. A. in New York in September, for which they had paid $1 and had not received the picture. We are in the same position, and so are the Fire Chiefs, who were in convention in New York at the same time. The photographer's name is Chas. F. Allen, address, 25 West 42d street, New York. Under date of October 8th, Mr. Allen wrote us as follows: "Delay in sending veterinary men's photos due to shortage of that particular size of paper—will be sent out Wednesday, October 15." Anyone not receiving their picture within a reasonable time should write Mr. Allen direct at above address.

TYMPANY OF THE RUMEN, OR BLOATING: WITH A PROMPT AND EFFICIENT REMEDY.*

By Daniel J. Healy and John W. Nutter, Lexington, Ky.

During the past spring there was an unusual growth of white clover in many of the pastures of Central Kentucky, and our attention was called to this subject by the occurrence of several cases of tympany in the station dairy herd.

As is well known, tympany, or bloating, may follow the ingestion of certain foods. Alfalfa and clover, especially the red and white varieties, while in fresh bloom, are particularly dangerous in this respect.

"Cadeac maintains that paresis of the rumen is the essential cause in all cases,"† but the following experimental work proves conclusively that when bloating follows the ingestion of certain foods, it is caused by rapid fermentation in the rumen.

J. W. Nutter, who has charge of the dairy herd, mixes sodium bicarbonate with the salt which is fed to the cows. This is a fairly satisfactory prophylactic measure, although from time to time a case of tympany will occur.

It occurred to one of us (Healy), that fresh clover blossoms may contain an appreciable quantity of sugar, which, undergoing a rapid fermentation in the rumen, would account for the acute distention by gas. To test this, a known quantity of fresh flowers, gathered from clover heads, was placed in 100 c.c. of distilled water and boiled for 20 minutes. The original weight was restored with distilled water, and the solution strained through a funnel, which retained the mass of flowers. The sugar content of the solution was then determined by the Fehling cop-

* From the Laboratory of the Kentucky Agricultural Experiment Station, Lexington, Kentucky. A preliminary note.

† Law, James, Veterinary Medicine, 1911, Vol. II., p. 96.

per reduction method. Red and white clover blossoms, alfalfa blooms, blue grass flowers, clover and alfalfa leaves were thus examined. That there is an appreciable quantity of sugar in the fresh flowers of alfalfa and of red and white clover is shown in the Table I. This table also shows that the sugar content of alfalfa and clover leaves and of bluegrass flowers is very small.

TABLE I.

Quantity. Grams.	Variety.	% of Sugar by Weight.
15.80	Fresh white clover flowers.....	2.43
8.00	Fresh white clover flowers.....	1.80
10.80	Fresh white clover flowers.....	1.21
13.60	Fresh red clover flowers.....	3.67
12.35	Fresh alfalfa flowers.....	2.88
8.00	Fresh bluegrass flowers.....	0.93
8.00	Fresh clover leaves.....	0.46
12.35	Fresh alfalfa leaves.....	0.67

That such flowers withering upon the stalk, or drying upon the laboratory table without fermentation, do not lose their sugar, is shown in Table II. Very similar conditions would occur during hay making in suitable weather.

TABLE II.

Quantity. Grams.	Variety.	% of Sugar by Weight.
12.10	White clover flowers withered on stalk..	1.58
7.70	White clover flowers withered on stalk..	1.21
2.60	White clover flowers dried in laboratory.	2.09
2.45	Alfalfa flowers dried in laboratory.....	2.24
2.45	Alfalfa leaves dried in laboratory.....	1.26

That a natural fermentation will occur, whereby the sugar present in these flowers is all converted is shown by the following experiment: The conditions are similar to those which would occur if a cow ate heartily of fresh, moist clover blossoms. A quantity of fresh clover blossoms was placed in a closed jar and fermented at room temperature for six days. The blossoms turned brown, then dark brown, and finally almost black. At the end of six days, 50 of these fermented clover heads were tested for sugar and found to contain none. A wild, top-fermentation yeast of the variety *S. ellipsoideus II.* was isolated from the water which had collected in the bottom of the jar.

That this process was a true and active fermentation was demonstrated in the following manner: 63 grams of fresh white clover blossoms were placed in a closed bottle, which was then connected with a flask containing 175 c.c. of freshly prepared lime water. Fermentation was allowed to proceed at room temperature, and at the end of 72 hours the flask contained a heavy precipitate of calcium carbonate.

In view of the fact thus demonstrated, that fermentation was the cause of bloating following the ingestion of fresh clover and alfalfa blossoms, Dr. Joseph H. Kastle suggested the control of this condition by the administration of formaldehyde. This we succeeded in doing in the following case reported by Mr. Nutter: "Lads Oona" bloated badly on white clover June 13, 1913. She was drenched with one litre of water containing 40 c.c. of formalin, that is, 4 per cent. formalin or 1.6 per cent. of formaldehyde; a block of wood was, at the same time, placed in her mouth, thus keeping it open. At the end of twenty minutes she had entirely recovered.

We have not had another opportunity of testing this treatment, but will test it thoroughly when the opportunity occurs. We do not hesitate, however, to strongly recommend for acute bloating one quart of a 4 per cent. solution of formalin, followed by placing a wooden block in the month and gentle exercise if the animal can be gotten up.

PRESCRIBING AND PRESCRIPTION WRITING.*

By I. L. Salley, D.V.S., Skowhegan, Me.

From time immemorial it has been the custom of veterinarians, and physicians as well, to use certain favorite prescriptions which have been handed down from ages.

These prescriptions were compounded many years ago by men whose scientific knowledge could not be up with men of to-day, and some of them probably by quacks.

In the beginning of the practice of medicine all were quacks, for, of course, they had no schools upon medicine to attend, no books to read as we have.

It is not at all surprising if these men should try and get a little of almost everything into their prescriptions, so that if one thing does not hit the case something else will.

These men were guessing, and it is probably the case that they figured that the more shot they had in their charge, the more likely they were to hit the mark. I don't suppose they took into consideration what damage they might do to things surrounding the mark by stray shot. You have heard of these gunshot prescriptions and I presume part of us have used them.

But in this we may excuse ourselves, and lay part of the blame to our Alma Mater. Who of us cannot remember the colic drenches, fever mixtures and tonic powders, etc., which we were taught to use. What the actions are, of some of these mixtures I have seen, it would take an expert with a big piece of paper to figure out.

I am not blaming the schools, for the professors were taught these things by their teachers, and so on it has been handed down.

Neither am I trying to criticize anybody; what I am trying to point out is, that I believe the use of conglomerations is

* Read before the Maine Veterinary Medical Association.

not scientific and should not be used by men who pretend to treat disease in a reasonable way.

It is all well enough for the quack to use these prescriptions with all the drugs in the pharmacopeia, because he has to; he is guessing all the time. But there are many things that a D. V. S. ought to know, and I believe he ought to apply this knowledge in prescribing and compounding the medicine for his patients.

I suppose some may think that if they can write a prescription with a lot of symbols that the laity do not understand, that their knowledge will appear to be according to the length of their list of drugs. I believe it better, in writing a prescription, to use just as few drugs as possible; very often one alone, sometimes two, with possibly a vehicle and maybe a corrective; but seldom should we need more.

I also think it better to carry in our cases straight drugs mostly, and mix them for each individual case at the time; for we will seldom find the same disease that requires just the same treatment. Hence, in the colic drenches we seldom find a case of colic that requires all of the things in the drench, and if a drug is not required it had best not be given. I do not believe in taking medicines to keep well; they should only be taken to correct some defect, and when the trouble is removed, stop the medicine.

When called to treat disease first make an accurate diagnosis, as you can then give the least number of drugs possible to correct the trouble and give in doses large enough and long enough to get the full effect of the medicine, and carefully watch the result.

A "GET-TOGETHER" MEETING IN COLLINSVILLE, ILL.—Dr. L. B. Michael, of Collinsville, Ill., has made preparations to have the veterinarians of southern Illinois "just get together where everybody has the floor," as the doctor has expressed it, at Collinsville, on November 15, 1913. Dr. Michael has arranged for a clinic in the morning to commence at 9 o'clock, and a session in the City Hall in the afternoon. The doctor desires anyone who for any reason does not receive an invitation to regard this notice in the REVIEW as an invitation and come to the meet.

REPORTS OF CASES.

GASTROTHORACOPAGUS.

By Chas. T. Frey, V.S., River Point, R. I.

This photo is one of a monstrosity taken from a large Holstein cow owned by one of my clients. On August 23, 1913, on arriving at the farm about 8 p. m., I found a posterior presenta-

tion, two hind feet in sight; made an examination, and proceeded, with assistance, to deliver the calf that way. We pulled until the hips came in sight, then could not get it any further. I then put it back, and tried to turn it; after some time I succeeded in getting the head and one forward leg, and after working awhile I found *three* hind legs. We pulled at the head but could not get the calf. I cut the head off and made another examination. I then told my client that we could not deliver it without dissecting it, which would be somewhat harsh for the cow, and from her experience that day, both before and after I got there, I did not think that she would make a good recovery; I therefore advised killing the cow. My client consented and the cow was destroyed that night. The owner drove down to my place the next morning with the calves, minus the head of one that I cut off, explaining that the dogs got it before he killed the cow and he could not find it. I am sending this to the REVIEW as it may benefit some of my brother practitioners. The calves were of normal size, in fact every way normal except the union from the sternum to the udder. They were both heifers.

THE MILK QUESTION is very ably dealt with in a most interesting address by Dr. Evans, of Chicago, delivered at the opening of the last day's session of the A. V. M. A. in New York, published on page 178 of this issue. The address was so excellent an one, by such an authority as former Health Commissioner Evans, of Chicago, that we have published at as early a date as possible that all our readers who were not fortunate enough to hear it from Dr. Evans' lips may read it here.

A FERTILE MULE.—On page 251 of this issue, Prof. Liautard cites the case of a mule having a foal; that being her second one. The case was reported in the *Veterinary Record,* from which it was also abstracted by the *Field Illustrated,* New York. This brings to our mind a case of lactation in a mule reported by us in the REVIEW, fully illustrated, on page 749, January, 1901.

DR. HUGH RUSSELL HOPKINS, class of 1911, New York-American Veterinary College, died at his home in Jersey City, N. J., on August 24, 1913, of tuberculosis, after an illness of fourteen months, in his 26th year.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By Prof. A. Liautard, M.D., V.M.

The Treatment of Pleuritic Effusions [*Capt. P. V. Beatty, A.V.C.*].—The minute record of a case which had occurred in a well bred pony mare, five years old, and had recovered after treatment of principally punctures of the chest and in which tapping was performed ten times in the space of six days, the total quantity of fluid removed being seventeen gallons and two pints. The mare was in no way upset by the operations. Improvement had been noticed after the first puncture and was maintained in proportion to the amount of fluid removed. Tapping was discontinued when the pulse and respiration had been normal for some days. It is probable that some fluid remained, but was reabsorbed in the course of time. The case was not afterwards complicated by synovitis nor lameness as not uncommonly found in similar cases.—(*Veter. Record.*)

Congenital Intestinal Defect in a Foal [*J. F. Craig, M.A.,M.R.C.V.S.*]—This was recognized only at post mortem and was unexpected. It was in a thoroughbred filly, which on the day following her birth was observed to be constipated and had passed no meconium. Laxatives and enemas were useless. The little animal died on the third day and the autopsy was made 24 hours after. Abdomen was tympanitic and bloody extravasation was observed under the peritoneum. There was some blood stained fluid in the peritoneal cavity. The large colon was represented by a single column of bowel, arranged in the normal position, bent on itself behind the xyphoid cartilage of the sternum. The blind extremity was directed backwards towards the pelvis. This piece corresponded to the first and second portion of the double colon. The third and fourth portions were absent. The bowel had four longitudinal bands near the cœcum, two of which gradually disappeared. The only opening in connection with it communicated with the cœcum. The blind extremity corresponded with the pelvic flexure of the normal

colon. The cœcum contained three pounds of meconium. The small colon ended in front by a rounded blind extremity, at the roof of the abdomen, on the left side behind the point at which the duodenum is continuous with the remainder of the small intestine. There was no continuity betwen the large and small colon, which was continuous with the normal rectum. The anus was quite normal.—(*Veter. Journ.*).

Gastric Tympany [*Guy Sutton, F.R.C.V.S.*].—Gelding had eaten a considerable quantity of oats. Next day he is very ill. Colic, etc. No relief is obtained by treatment. After 18 hours the condition is critical, cold sweat, unsuccessful attempts at vomiting; abdomen enormously distended. Only a horse catheter is at hand. It is passed up the nostrils, through the œsophagus and reached the stomach. The result is magical. Spray was shot from the mouth of the catheter for at least a yard, and gas escaped with hissing noise. The horse was instantly relieved.—(*Ibidem.*)

Ovaro-Hysterectomy in an Uncommon Case [*J. Peddie, F.R.C.V.S.*]—Bull bitch was pregnant by a large size retriever and has great difficulty to deliver. Five pups are removed from her easily, but only part of another could be taken out when the writer was called. A large pup is still in a horn of the uterus. Vaginal examination reveals nothing. An operation is indicated and consent of the owner given. After careful anasthesia, the abdomen was opened and the uterus exposed. The walls of the organ are very thin, the right horn is ruptured in two places. From the largest tear, one-half of the complete puppy was protuding in the abdominal cavity; the remainder of the pup, part of which had been pulled away, had come by a breech presentation and was in the right horn. Ovaro-hysterectomy imposed itself and was carefully performed. The dressing was made and kept by adjusted abdominal girth. The bitch did well, having only on the 9th day a small hernia of the omentum, which was reduced and the opening closed by sutures. After this recovery followed. —(*Veter. Jour.*)

Renal Sarcoma and Prostatitis in a Dog [*F. J. Taylor, M.R.C.V.S.*].—Aged Aberdeen terrier has trouble in using his hind legs, he micturates frequently. Some times the urine is stained with blood. He has obstinate constipation, his back is

arched and he is very sensitive to pressure on the loins. The prostate is much enlarged and readily felt, by rectal examination, surrounding the neck of the bladder. Each lobe is almost the size of a bantam's egg. The owner refuses to have him castrated and the dog is destroyed, after some unsuccessful attempts with the iodides. The postmortem revealed a growth of glandular tissue, surrounded by dense, hard muscular tissue and the left kidney hypertrophied. The bladder was thickened from cystitis. —(*Ibidem.*)

Disease of Middle Ear—Linguatula Tèniodes in Nasal Chamber of an Otter Hound [*H. Tudor Hughes, M.R.C.V.S.*].—Otter hound, six years old, was taken ill suddenly, seems to suffer from inco-ordination of movement, carries his head low and to the left. He had advanced condition of canker in the ears, worse in the left. He grew worse and was killed as incurable. *Postmortem:* Female linguatula tœniodes found in the right nasal cavity. It was alive, although the dog had been dead two days. External auditory meatus of the left side was crammed with impissated discharge. The middle ear contained a small quantity of bloody effusion, which run out when the ear was opened. The lining membranes and the tympanum being thickened. There was also discharge in the right ear, but the middle ear of that side was normal. The discovery of the linguatula was a surprise, as the dog had shown no clinical symptom of its presence. The dog must have been affected about six months at least, as the female parasite was fully matured. No male parasite was discovered.—(*Veter. Record.*)

Mule Mare With Foal [*Government Veterinary Surgeon G. J. Harvey, M.R.C.V.S.*]—The writer says: "I examined the subject and found it a genuine mule. Should say it was bay with black points, six years old. This foal is the second. The first was a filly last year. This one is a male. The first died after two months, the second lives. The mule was bred from a she-donkey, and the foals from her are by a jack. No special marks or stripes. The mule was giving milk and the foal sucking. He somewhat resembles a young donkey, but bigger. The dam is a genuine she-mule." A nice photo illustrates the record.—(*Veter. Record.*)

An Open Joint [*W. Brown*].—Very interesting case with a moral. "Submit your diagnosis to further consideration, as well as your patient."

A horse has a small punctured wound, six inches below the elbow joint, discharging small quantity of blood-serum. The animal is not lame and the case is considered as a simple one, as there is no history of any accident being the cause. Simple treatment is ordered but the case gets worse. Swelling of the joint, pus is formed round the point of the elbow, it is allowed to escape. The wound healed but the animal, which had been put in slings, remains very lame. Then the original puncture began to discharge synovia, continuous cold douches are prescribed. The condition does not improve. The owner gets tired and finally the horse is destroyed. *Lesions found at autopsy:* Underlying tissues, over the area of the original wound, broken down and purulent. There is infiltration of synovial fluid. The joint is involved, with the surface of the inner condyle of the humerus eroded and fractured, the head of the ulna is fractured and the radius the seat of a splintered fracture. *Moral: First examination and also subsequent, had not been sufficient because of a preconceived diagnosis—manly acknowledged by the author.* (Ed.)—(*Veter. Record.*)

Clove Oil in Open Joint [*F. J. Dunning, G.V.S.*].—Lame horse had small wound on outside of the leg about an inch below the fetlock. It is not probed, and a few days after a splinter of wood came out. The leg swells, pain is great, excessive lameness, synovia escapes very freely. Corrosive sublimate lotions and antiseptic dressing are resorted to. Animal gets worse. One cubic centimeter of oil of cloves is injected twice a day and antiseptic bandage put on. Granulations rapirly filled the cavity, even proud flesh develops and completely closes the wound. Swelling of the leg remains but with bandaging and later blistering is gradually removed.—(*Ibidem.*)

FRENCH REVIEW.

By Prof. A. Liautard, M.D., V.M.

Bony Tuberculosis of Fowls [*MM. Chretien and Raymond*].—Besides the classical lesions of the glands and viscera observed in fowls, there exist lesions of the bony system, which have not yet received special study. The writers have noted them in more than 90 per cent. of the tuberculous birds they have examined. The lesions are in the various parts of the skeleton, where bony marrow is found. They are easily observed, especially in the femur and tibia, where if the bones are opened lengthwise they appear here and there. At the beginning of the disease,

there are in the marrow small centers of softening greyish in color, poorly defined, which rapidly become caseous, semi-solid, yellowish and clearly distinct from the dark red coloration of the marrow. In the ribs and other bones the lesions are also frequent and have the same aspect. There are sometimes macroscopic bony deformations. All these lesions contain tuberculous bacilli in great quantity. They even exist in the marrow outside of all macroscopic lesions.—(*Hygie-de la Viand. et du Lait.*)

ARTICULAR WOUNDS—THEIR TREATMENT [*Capt. Dignac Army Veterinarian*].—In the records of three cases that the writer makes, he confirms the indications that we alluded to in the Chronicle, on the subject of traumatic arthritis, and brings with some little difference or modifications the authority of his success to this treatment of articular wounds, namely, simply the suture of the wound. The hair is clipped round it, the region coated over with tincture of iodine, sutures with Florence hair or pins with aseptic precautions and friction on and around the wound of biniodide of mercury ointment. Recovery is rapid, generally inside of a week, but return to work only after 10 or 15 days.

In a first case it was a wound of the right hock, where there was hydrathrosis. The synovia was escaping, the synovial inflamed and the animal was very lame. After an injection of antitetanic serum, the wound was dressed as above. Improvement the next day and recovery in two weeks.

A second similar case resumed work in ten days. In the third case there was suppurative arthritis of the left temporo-maxillary articulation with complete recovery in 16 days.—(*Revue Gener.*)

PARTURIENT APOPLEXY WITH RELAPSE [*M. H. Brissot*]—If such cases are common, says the writer, he has failed to find any record of them and besides, classical works do not mention them. Recently delivered, an ordinary bred cow has all the symptoms of parturient apoplexy, between 24 and 36 hours after calving. Classic treatment is applied at once. Insufflation of the udder, subcutaneous injections of one gramm of cafeine in two doses, cold water compresses over the head. Result, the cow is up after three hours of illness. Twenty-four hours later she is not so well. The mammae have been squeezed out of the air inflated. On the next day all the symptoms have reappeared; sterno-abdominal decubitus, bending of the head and neck, temperature 38.1° C. pulse small, etc. Feces are dry, hard, with bloody mucosities. Urine is clear and albuminous. Same

treatment is resorted to and the next day the cow is convalescent. —(*Rec. de Medec. Veterin.*)

ABSCESS IN LEFT CEREBRAL HEMISPHERE [*Capt. A. Videlier, Army Veterinarian*].—Eight-year-old horse, suddenly drops in his stall one morning and cannot get up. Sinapisms of mustard are applied on the four legs, 3 litres of blood are taken from the jugular. The horse succeeds in getting up, but immediately falls down again, his legs being unable to support him. Caffeine and camphorated oil are injected subcutaneously and another bleeding at the jugular performed. The animal lays down, gets up and drops again, he raises the head, has sudden contractions of the legs. Diagnosis is uncertain. After 13 hours the animal dies. Every organ was found normal at the autopsy except the brain. The right hemisphere is normal, but when the left is opened, abundant creamy suppuration escapes. In the posterior region of the hemisphere there was a closed abscess as big as a nut, whose origin was not made out, perhaps from strangles.—(*Ibidem.*)

HYPERTROPHIC CIRRHOSIS OF THE LIVER IN A HORSE [*D. Guillaume and Chaumay, Army Veterinarians*].—Anglo-Arab, six and half years old, has been losing flesh notwithstanding various regimes and treatments. He is very thin, coat staring, looks dull and tired, appetite is capricious. His temperature is 37.8°, pulse 42, respiration 12. The visible mucous membranes are highly congested, that of the mouth is purplish. The tongue is moist. There is frequent grinding of the teeth. Nothing abnormal in the chest. The abdomen is pendulous and the flank hollow. There is dullness on the right side from the 12th rib to the last, extending downwards from the external border of the ileo-spinal groove to the lower third of the thorax. No dullness on the left side. Urine is thick and red orange in color. Diagnosis of gastro-enteritis with probable hepatitis is made and tonic treatment prescribed, after proper attendance to the teeth. For two months no improvement took place. There has been no change in the symptoms except a weakening of the heart's action and an increase in the size of the zone of dullness on the right side. It spreads in the hypochondriac region and is also detected on the left side, on the upper third of the chest. Iodide of potash and digitalis are ordered. Then the two hind legs are taken with severe lymphangitis. Swellings and formation of small abscesses which being opened give out thin, sanious pus. The animal continues to lose flesh and finally dies after an illness of

nearly four months. The principal lesions found were in the liver, which weighed 19 kilograms and presented all the characters of hypertrophic cirrhosis.—(*Bullet, de la Soc. Centrale.*)

DERMATOMYOMA IN A CAT [*Prof. Doct. V. Hall*].—This tumour, very rare in man, is still more so in animals. The writer has seen one in a six-year-old cat. He had on the right side a little out of the median line and back of the shoulder a bosselated tumour, ovular, involving the dermis and hypodermis and measuring 8 centimeters in length and 8 in width. On its surface, the skin had some alopecia, and appeared slightly translucid at one point, where there existed a fistulous opening through which escaped brown yellowish fluid. The tumour was firm and on section exhibited a cavity with granular walls. On the left side of the thorax, there was another small tumour. These growths were dermatomyomas, being constituted of masses or fasiculi of smooth muscular fibres, easily recognized by their form, their nucleus and their facility to take coloring matters. The origin of dermatomyomas in man is supposed to be in the neoplasic evolution of the muscular fibres of the *arrector muscles* of the hairs, or the muscular cells of blood vessels.—(*Journ. de Zootechn.*)

MELANOTIC SARCOMA WITH CUTANEOUS AND POLYVISCERAL METASTASIS IN A DOG [*M. Sammon*].—Gordon setter, five years old, becomes suddenly severely lame on the left fore leg. He has a swelling of the extremity of the internal toe, which though treated and opened with a hot iron gets worse. The dog walks on three legs and is losing flesh. The swelling is as big as an hazel nut and through its open center shows a suppurating black surface of ugly aspect. The toe had to be cut off and the dog seemed to have recovered. A few months later he had on the base of the neck in front of the left shoulder a very large tumour, as big as the fist. This suppurated and contained dirty black looking pus. Other tumours made their appearance on the skin, on the right flank, in the muscles of the abdomen, and notwithstanding great care the dog had to be finally destroyed. At the post mortem, centers of melanotic formations were found in all the organs except the liver, which was entirely free from them. —(*Ibidem.*)

GERMAN REVIEW.

By JOHN P. O'LEARY, V.M.D.

CONCERNING THE ACTION OF PETROLEUM [*Prof. Kauffman*]. It is well known that necrosis accompanied with suppuration is very difficult to heal, particularly when affecting cartilaginous

tissues, tendons and ligaments, because on the one hand in these organs the vascularization is not sufficient to compensate for the loss of vital action in the parts throughout the inflammatory process, and on the other hand the necrosis in the deeply protected parts in which bacterial infection is active, is difficult to treat. The necrotic layer prevents direct contact of the antiseptic remedy with the inflamed living tissue cells. The author has used petroleum for the last ten years with constant success in poll-evil, fistulous withers and cartilaginous quittors, in necrosis of the aponeurosis of the flexor tendons, in suppurating articular inflammations and in caries of the maxillae. In general it is an excellent antiseptic; it has also the properties of being easily applied and of being introduced into the narrowest fistulous openings and there impregnating the tissues.

It never irritates wounds, only those lesions of the skin in contact with hair. In order to prevent this an application of fat to the wound must precede the use of petroleum in order to protect the skin and keep it pliant. When petroleum comes in contact with necrotic tissue, it rapidly dissolves the collodial substances which impregnate the necrotic layer, dissolves the latter and renders aseptic the inflamed underlying tissues without harmful effect. In order that the petroleum may gain entrance to all diseased parts a careful and methodical system of drainage of the fistula is an absolute necessity. Usually a cure is effected in this manner in about eight days. Nevertheless it occurs frequently about this time in the treatment of cartilaginous quittor and fistulous withers that new fistulae are discovered which had not been previously noticed and which become remarkable through painful indurations in the midst of soft painless swellings. These heal rapidly by establishing a second system of drainage and another application of the remedy. The author concludes his treatise with the following remarks. 1st. Petroleum is an excellent antiseptic agent, it is also possessed of particular properties which renders it desirable for the treatment of necrotic inflammation of the tissue cells when in a condition of lowered vitality. 2d. The treatment of bacterial necrosis with petroleum gives much more rapid and certain results than that of any other classical procedure. 3d. In order to attain the best results with this preparation, the diseased parts must be thoroughly impregnated.—(*Berliner Tierarztliche Wochenschrift Nr.* 12, 1913.)

CALF SCOURAGE AND SEROTHERAPY [*Dr. Ettore Gentili in Pava.*].—In Lombardy calf scourge is said to be due to various infectious and contagious diseases of the newly born calf as dysen-

tery, polyarthritis and septic pneumonia. In so far as dysentery and polyarthritis are concerned, according to the results of the investigations of Prof. Stazzi and particularly the more recent investigations of the author, they are due to a colon bacillus, in a few cases bacteria of the paracoli and paratyphus group and once the bacillus pyocyaneus was observed to be the cause of the disease. As an effective remedy for the eradication of this malady, Prof. Stazzi obtained a polyvalent serum from horses which were treated with a virulent strain of the coli bacillus. This serotherapeutic remedy must be applied if successful results are to be attained in a few hours after birth or at most before the sixth hour of life has expired. As a result of the timely application of the protective serum in many localities where for more than three years the calf scourge had prevailed uninterruptedly the mortality has been reduced from 95-100 per cent. to 0 per cent.

Where unsuccessful results were attained it could be traced to delay in the application of the remedy or to too small a dose of the serum or to some technical error.

There is also a very grave form of disease attacking the newly born calf which according to the investigations of the author is caused by infection with the Bang-Stribolt abortion bacillus and which follows a course similar in symptoms to calf dysentery. The serotherapeutic experiments to combat this particular form of disease are at present not concluded. However, it may be stated that favorable results are anticipated.—(*Berliner Tierztl. Wochenschift No.* 18, 1913.)

External Remedies in Medicine—Glycerine Applications [*Dr. Sustmann in Verden.*].—Sustmann, on the ground of his experience lauds the action of glycerine in external diseases. He has shown that the antiputrefactive action of this remedy had been recognized for many years past, that it had been used in combination with tannic acid, boric acid, iodoform, and so on, in the treatment of cutaneous diseases; however, notwithstanding this, its use has been abandoned because many other remedies have been placed upon the market as substitutes. In the treatment of open wounds the official glycerine ointment may be used instead of glycerine.

Sustman experienced success with glycerine salve in conjunctivitis in combination with the agents previously mentioned, also in the treatment of saddle galls, chafing, eczema, mallenders, erythema, skin wounds, ulcers, knee abrasions. The use of glycerine applied with a bandage in chronic sores and ulcerating wounds and similar conditions with an accompanying cellulitis has a bene-

ficial action, also in cases of interfering when the fetlock is injured. On the contrary, spontaneous phlegmon or similar processes do not respond to the glycerine treatment.

The addition of boric acid, tannic acid, iodine, iodoform, creolin, and so on, is not absolutely necessary; although it cannot be denied that the addition of these agents have a specific action on skin lesions. Sustmann never observed disagreeable secondary effects from the use of glycerine in his practice.—(*Deutsche Tierarztliche Wochenschrift, 1912, Nr. 12.*)

SHEDDING OF THE PROTECTION HAIRS AS A SECONDARY DISEASE TO A SEVERE CASE OF INFLUENZA PECTORALIS [*Chief Vet. Kegler*].—As a secondary disease to a severe case of influenza pectoralis, Kegler observed in a five-year-old gelding shedding of the hair of the tail, mane and foretop, which was not only remarked in the cleaning of the animal but was also spontaneous in character; and not only the long hairs were shed individually but also in tufts while the short hairs remained firm. Abnormal exfoliation of the cuticle was not present neither was a diseased condition of the individual hairs nor a pruritis observed. The treatment consisted of clipping the protection hairs, disinfecting baths of sublimate solution 1 to 1,000 and applications of balsam of peru and spirits equal parts.

Kegler regards the loss of hair as probably due to the severe attack of influenza and to the prolonged convalescence as a result of the ill nourished condition of the animal.—*Zeitschrift für Veterinärkunde, 1912, 6 Heft, S 278.*)

PURULENT CATARRH OF THE FRONTAL AND MAXILLARY SINUSES IN A HORSE AS A RESULT OF THE ACCUMULATION OF FOOD STUFF DURING MASTICATION.—A rare case of catarrh, purulent in character of the frontal and maxilliary sinuses was reported from the district of Adelnau as occurring in a horse. The symptoms were a nasal discharge from one side only, bulging of the frontal bones, swelling of the laryngeal lymph glands and emaciation. The animal was destroyed and in section there was found betwen the first and second molars on the left side a cavity filled with food stuff. The left superior maxilliary and both frontal sinuses were packed with food material.

The frontal septum had completely disappeared. The wad of compressed food removed from the frontal sinuses resembled a skittle ball in size and shape.

The frontal sinus was inflamed and its walls were covered with a layer of pus 1 mm. in thickness.—(*Veroffentlicheungen aus den Jahres-Veterinar-Berichten der beamteten Tierarzte Preuszens fur das Jahr 1910. Berlin 1912. 1. Teil. Seite 45.*)

CORRESPONDENCE.

OXYGEN SUBCUTANEOUSLY.

HARTSHORNE, Okla.

Editors AMERICAN VETERINARY REVIEW, New York:

Have you published anything in the AMERICAN VETERINARY REVIEW on the subcutaneous use of oxygen as a therapeutic agent during the past five years? If so, in what issues; and if not, do you expect to publish anything on this subject in the near future? I am very much interested in the subcutaneous use of oxygen as a therapeutic agent in my practice for human beings and would like to know if any veterinarian has ever used oxygen subcutaneously as a therapeutic agent in practice among animals; and if so, with what results.

I cannot find much literature on the subcutaneous use of oxygen in the English language. It occurs to me that oxygen has been used subcutaneously with good results in various diseases in Europe, but as far as I can learn, the subcutaneous use of oxygen in America is practically unknown and has been used very little. There are a few abstracts from foreign journals in the *Journal of the American Medical Association,* August 3, 1912, page 404; November 16, 1912, page 1830, and March 26, page 1401. The Roessler and Hasslacher Chemical Co., 100 William street, New York, issue a small amount of literature on the subcutaneous use of oxygen and make an apparatus for giving oxygen subcutaneously to human beings. I feel satisfied their apparatus would be sufficient to give oxygen subcutaneously in veterinary practice, and mention this matter for the benefit of those who wish to try it; for this is the only house I know of in the United States that supplies such an apparatus. I fully believe that the subcutaneous use of oxygen deserves due consideration and investigation from both physician and veterinarian and I write this to stimulate investigation; and would be pleased to hear from any one on this subject as to results either good or bad, and to receive reprints of articles on this subject. The veterinarian is in a good position to investigate

this subject, as the remedy is cheap and he could get proper clinical material.

If the veterinarian would take this in hand, then we physicians in human practice could learn much from them as to the technique of the injection, the physiological effect, therapeutic action, contra-indication, and dosage.

I hope at least the laboratory of some veterinary school will take this subject up for a thorough investigation.

Apparently the subcutaneous use of oxygen promises much in a great variety of diseases in human practice, and I feel sure it would be of equal value in veterinary practice. Subcutaneous or hypodermic medication of various remedies is constantly growing in favor the world over.

J. A. BURNETT, M.D.,
Member of Pittsburg Co. and Oklahoma State Medical Associations, and Fellow in the American Medical Association.

EUROPEAN TOUR—TENTH INTERNATIONAL CONGRESS.

Washington, D. C., October 21, 1913.

Editor, AMERICAN VETERINARY REVIEW, *New York City.*

I am herewith forwarding to you a letter which I received from Prof. Francis Hutyra, relative to our proposed European tour in connection with the attendance of the Tenth International Congress at London in 1914.

I am very glad to know that there is a great deal of interest manifested by members of our profession in the tour and the congress, and from all indications we hope to have a creditable delegation from this country.

As secretary of the National Committee of the United States for the Tenth International Veterinary Congress, it would probably be advisable at this time to call to the attention of the members of our profession in this country that in order to become members of the International Congress a fee of $5 is required, in return for which all publications, including the final report of the proceedings in several volumes, will be sent to all members. The possession of this alone would more than repay the members for their expenditure. It can not be expected that all those who would desire could personally attend the Congress

at London, and at the same time they would appreciate becoming members of the Congress. I would request all those who desire to attend to inform me of their intention at an early date, in order that arrangements for reservations can be made.

I beg of you to publish the letter of Prof. Hutyra, which indicates the interest which will be shown towards our touring party, and we will make an effort to secure proper attention from the authorities in the different countries to be visited for the benefit of our traveling veterinarians.

Very respectfully,

(Enclosure.) ADOLPH EICHHORN.

Budapest, September 29, 1913.

DR. A. EICHHORN, Department of Agriculture, Washington, D. C.

My dear Colleague:—From your letter of September 16, I have learned with the greatest pleasure and with the feeling of my deepest sincere gratitude of the honoring distinction which was shown to my humble person by the American Veterinary Association in electing me as an honorary member. Even until I receive the official notification, so that I may express directly my appreciation, please accept and express to all those colleagues who were kind enough to recommend me for the honor the sincere expression of my warmest gratitude.

I have also learned with the greatest satisfaction your kind information that the second edition of our textbook is already in preparation.

At last but not in the least agreeable was your news that a party of American veterinarians contemplates visiting Hungary on the occasion of an European study tour. It is natural that we will aim to make their stay with us as pleasant as possible. Nevertheless, according to my view, it would be advisable to have the Government of the United States inform the Hungarian Government through the diplomatic representative of the visit, as in that case our Government would without a doubt more likely and to a greater extent make all arrangements for a comfortable visit and proper entertainment at the stock breeding establishment of Mezohegyes, Balbolna and Kisber.

Again expressing my best thanks, I am, with kindest regards,

Sincerely yours,

(Signed) FRANCIS HUTYRA.

HARVARD UNIVERSITY MEDICAL SCHOOL, BOSTON, MASS.

September 23, 1913.

The Editor, AMERICAN VETERINARY REVIEW, *New York City:*

I had opportunity this summer to witness the extent of hog cholera in Southern Iowa. The rapidity with which it spreads makes it appear as if there were other agencies than those commonly described as transmitting the virus, such as shoes, stock, wagons, birds and fowls which have come in contact with the infected discharges, carrying it to uninfected premises. To me it seems very probable that some biting insect may take an important part in assisting in the rapid spread of hog cholera over wide areas. This summer *Stomoxys calcitrans,* the common stable fly, was very abundant in Southern Iowa, and I observed it biting hogs (on the ears) on premises where hog cholera existed and on others where hog cholera had not as yet made its appearance. The character of the disease, *i. e.,* septicæmia, would make it possible for a biting insect to materially assist in the dissemination of the virus, in addition to the other agencies commonly described.

Yours truly,

MARK F. BOYD.

MARSHALL, Ohio, September 26, 1913.

Editors AMERICAN VETERINARY REVIEW, *New York:*

SIRS—Following are a few questions that I have not had satisfactorily explained:

(1) What would be the result if an animal have both vas-deferens severed by a clean surgical operation, the testicles and all left in their normal position, none of the reproductive organs being disturbed?

(2) Will a cow conceive and carry the fœtus full term if she has had her udder removed while she was a calf, and if so, is she any more subject to parturient apoplexy than one with a normal udder?

(3) Is the venous circulation harder to gain access to by invading bacteria than the lymphatic circulation in contagious diseases contracted by invasion through the mucous membranes?

Yours truly,

A. W. SELLERS, D.V.M.

BIBLIOGRAPHY.

POCKET CYCLOPEDIA OF MEDICINE AND SURGERY.

GOULD AND PYLES POCKET CYCLOPEDIA OF MEDICINE AND SURGERY. Based upon the Second Edition of Gould and Pyles Cyclopedia of Practical Medicine and Surgery. Second Edition; Revised, Enlarged and Edited by R. J. E. Scott, M.A., B.C.L., M.D., New York. Formerly Attending Physician to the De Milt Dispensary; Author of the State Board Examination Series; Editor of Witthaus' Essentials of Chemistry and Toxicology and Hughes' Practice of Medicine, etc., etc. Philadelphia, P. Blackiston's Son and Co., 1913. Cloth $1.00 net.

This neat little volume is a pocket abridgement of the standard Cyclopedia of Medicine and Surgery by the same editors, and contains, in addition to a complete medical dictionery with illustrations of surgical conditions, and ten pages of tables of the principal arteries, making the study of their origin, distribution and branches simple and rapid, tables of weights and measures, a physician's dose-table which occupies 19 pages, giving the dosage of drugs in both the apothecary and metric systems. Upwards of 30,000 copies of the previous edition have been sold here and abroad. In this revision the general plan remains as before but a large amount of new material has been incorporated, the number of cross references has been largely increased and the editor has kept in mind the wants of the general reader in search of immediate information. It is *multum in parvo* and is invaluable. Bound in soft black leather with round corners, and lettered in gold (the leaves being also gold-edged), this little volume, 6¼ x 3¾ x ¾ fits easily in the inside pocket of any coat, providing the physician or veterinarian with accurate medical or surgical data, readily accessible at all times, whether walking, driving, train-riding or elsewhere.

A COMPEND ON BACTERIOLOGY.

A COMPEND ON BACTERIOLOGY, INCLUDING ANIMAL PARASITES, by Robert L. Pitfield, M.D., Pathologist to the Germantown Hospital; Late Demonstrator of Bacteriology at the Medico-Chiurgical College, Philadelphia; Visiting Physician to St. Timothy's Hospital and Chestnut Hill Hospital, Philadelphia. Second Edition, 280 Pages with 4 Plates and 85 other illustrations. Philadelphia, P. Blakiston's Son and Co., 1913.

This little book was designed by the author, more especially to meet the needs of the medical student preparing for examina-

tion, which makes it eminently fitted to the uses of the practitioner (medical and veterinary) who desires to keep abreast with the principal facts of the rapidly growing science of bacteriology. For that reason the subject matter has been made as concrete as possible.

The chapter on immunity gives in outline the essential accepted teachings on that important subject. The work is divided under eleven headings, as follows: (1) The Classification, Morphology, and the Biology of Bacteria; (2) Products of Bacterial Energy; (3) Infection; (4) Immunity; (5) Study of Bacteria; (6) Bacteriological Laboratory Technic; (7) Antiseptics and Disinfectants; (8) Bacteria; (9) Animal Parasites; (10) The Filtrable Viruses; (11) Bacteriology of Water, Soil, Air and Milk. The author has drawn freely from many standard text-books. Many illustrations are from Kalle and Wassermann's Atlas, Williams, McFarland, Tyson and others. The work being well illustrated, and in its condensed form makes a ready reference book for both the veterinarian and the physician, more especially adapted to the needs of the latter. The publishers are to be commended for the manner in which they have executed their work.

DR. A. D. MELVIN HOME.—Dr. A. D. Melvin, Chief of the Bureau of Animal Industry, U. S. Department of Agriculture, has returned from a trip to South America, where he had been studying the stock-raising and meat industries, and the possibilities in regard to their future extension, as an agent of the United States Government. The doctor reports his trip as a pleasant and instructive one, and is glad to have had the opportunity of making it; but, as is the case with all men from the "States," it has impressed upon him the fact that "the United States of America is the best country in the world." The doctor reports having met a number of very high-class veterinarians, all of whom are occupying government positions. By the way, rumor has it that Dr. Melvin himself had accepted a position in Argentina and was to return there in the near future at a high salary. That rumor is entirely erroneous, and the doctor desires that impression corrected through the medium of the REVIEW, as he has no intention of leaving the United States.

ADDRESS OF SECRETARY OF AMERICAN VETERINARY MEDICAL ASSOCIATION—The address of Dr. Nelson S. Mayo, secretary of the A. V. M. A., is 4753 Ravenswood avenue, Chicago, Ill.

ARMY VETERINARY DEPARTMENT.

IF THERE WERE TO BE WAR WITH MEXICO WHERE WOULD WE GET THE HORSES?

The *Army and Navy Journal* is exercised over the dearth of horses in the United States at present, of a kind to satisfy the specifications of the Quartermaster Corps of the War Department, which, it states, cannot be had in sufficient numbers for the present peace army. In the event of war with Mexico, sooner or later, that newspaper is wondering where the mounts for the cavalry are to come from. We here reproduce the whole of the note from the August 2d *Army and Navy Journal;* also we add the leading article from the August 9th number of the same journal:

"If the United States army is sent into Mexico, it will be necessary to supply it with horses from the United States. After investigation of conditions in Mexico it has been found that there is no available supply of horses in the country, as practically all the good animals have been used by the Mexican federal government and the various revolutionary parties. As a consequence, the minute that the United States Government decides to intervene, the Quartermaster Corps will be in the market for a large supply of mounts. It will require three months' training and treatment to put the horses in condition to send them to Mexico. It has been the experience of the War Department that about twenty or thirty per cent. of the horses purchased in the open market are incapacitated by train-sickness. After they are gathered together at a central point, all of them must be put under the care of veterinarians and treated. Recently forty out of one hundred and eighty horses, purchased for the Winchester camp, were taken with train-sickness, and it will be a month or two before they are ready for service. The Department of Agriculture has an excellent treatment, which has reduced the deaths to a minimum, but no preventive of train-sickness has yet been discovered." (*Note*—Notice the army veterinarian is not given any credit for his good work along this line.)

Prospects of a Horseless Era.

"If enthusiasm could assure a victory, there is little doubt that the officers of the Mounted Service School at Fort Riley would win at the Berlin Olympic games of 1916, and it is unpleasant not to be able to share the high optimism with which Capt. Ben Lear, Jr., 15th United States Cavalry, writes in the *Rasp*, reviewed in our issue of August 2d, of the American prospects in 1916; but, in all frankness, we may say that the rainbow which Captain Lear seems to see with all its colors gives only a very faint tinge of color as we view the sky of hope.

"It would be in the highest degree gratifying if the Mounted School could make a clean sweep at Berlin. Nothing would do more to give that school a high plane in the esteem of the American people than an overwhelming success in 1916, but the supply of horses from which we have to draw such winners does not seem large enough to insure gratification of Captain Lear's hopes. We recall the book published a little more than a year ago by Spencer Borden, of Fall River, Mass., on the scarcity of cavalry horses. This very instructive book, all the more worth while because of the disinclination of the author to avoid unpleasant comparisons, was summarized in the *Army and Navy Journal* of April 27, 1912, page 1071. The keynote of this book is to be found in its statement that 'if this country were to become involved with any other power at the present time the army of the United States would not know where to find the horses for its mounted service, no matter what it would be willing to pay.' The drift of the times in the matters of transportation is away from the development of horses. Until the invention of the railway the horse was practically the sole means of transportation from city to city and from country to country. With the introduction of the steam vehicle the use of the horse was lessened, but as steam car was restricted to a particular metal roadway the horse still had a large vogue for short distances where railroads were not operative.

"Up to the time of the bicycle the horse was the means of obtaining the most rapid transportation away from a railway track, but the bicycle soon had the horse beaten, and upon the heels of that came the automobile, *which can practically go wherever the horse can go and many times faster.* The decreased interest in the horse may be seen in the attitude of the public towered lowered records in trotting and running. In the days of Flora Temple, Dexter, Goldsmith Maid and other fast trotters, interest in their achievements ran high, for a reduction in the

time for covering a mile might mean a development of speed generally for the carrying of people about the country. So when a running horse like Longfellow or Harry Bassett in the famous days of the early turf history of this country lowered the record, it was held to mean just so much of a step forward in the means of transportation; but now, when the automobile dashes over country roads with the speed of the fastest locomotive, it is difficult to arouse much popular enthusiasm in the cutting of a horse record by a second or so, for its practical value is virtually nil as compared with what it meant fifty years ago. In those times every little town had its livery stable. Now the livery stables are being turned into garages for automobiles, and livery horses are becoming fewer and fewer. The improvement of roads throughout the country is being pushed with an eye to comfort of the automobilists, not the horsemen. On the top of all this has come the aeroplane to promise still more surprises in transportation and a still further reduction in the practical value of the horse. All this lessening of interest in man's best friend as the primary means of transportation must be reflected ultimately in the supply available for cavalry, although it may be possible that government aid may offset in some measure the depreciating influences of other means of transportation and furnish to the army, horses of the first-rate quality, but that this aid must be very liberal and continuous no one will doubt who has given the subject much close attention."

Is it true that the automobile can go practically everywhere a horse can go and a good deal faster? In the event of war with Mexico the automobile would cut a poor figure trying to caper through the jungle and morass and over the rough mountain roads of that wild country. This statement must be taken *cum grano salis*—with a grain of salt. The editor of the *Army and Navy Journal* is trying to shiver the timbers of hope in which Captain Ben Lear, he believes, is imaginatively sailing.

Apparently these two articles do not harmonize. In reality they are meant to be pitched in the same key. The *Army and Navy Journal,* which is the authoritative newspaper of the two services, as much as the *Gazette* is the authoritative newspaper of the British army, knows very well that one of the most trying things in the army is the problem, and a very grievous one it is, of how to get horses of sufficiently high grade, in sufficient numbers, to carry on the work of the cavalry. Every one who has any information on this subject knows that the Quartermaster Corps is working with the Bureau of Animal Industry, our

" national veterinary bureau," as it has been called, in an attempt to popularize anew the breeding of horses of a type suitable for the army and to make it profitable as well as a business. The army hardly gets enough horses of a satisfactory kind to mount its few cavalry regiments on a peace footing, and the statements made by the officials concerned in the work of improving the breeding and increasing the supply go to show that the time has come when the problem—how to get horses of any character in time of war—would be a most vexatious one.

There is no doubt that the problem at bottom is mercantile, agricultural and military. The digest of present-day conditions and new-fangled means of locomotion is correctly put. Means of motility are different now from what they were a few years ago when " man's best friend " was nearly the only means of transportation. That is the mercantile phase of the problem. Again, farmers have gotten out of the way of breeding saddlers, largely for the reason that there was no call for them and no profit in them—that is the agricultural phase of the problem. Besides, military people only wanted a few saddlers each year and they were but a small part of the sum of the original buyers in the heyday of the saddle and carriage horse. Instead of tending to increase its sales, the army preferred to hammer down prices, keep to as low a point as possible the number of mounts purchased, and, worst of all, peace year after year prevailed in the land so that there was no chance of the army swelling in size, either suddenly or gradually. Hence the cry which the *Army and Navy Journal* has raised: " If we go to Mexico, where are we to get the horses? " This is the military phase of the subject.

To our mind two points stand out very conspicuously in view of the interrogatories of the *Army and Navy Journal.* The first is that the horse is in the army to stay. It is just as absurd to think that we can have cavalrymen without horses as to think we can have horses without cavalrymen. The *Army and Navy Journal* knows this better than we do and voices it when it says: " The minute that the United States Government decides to intervene, the Quartermaster Corps will be in the market for a large supply of mounts." The cavalry arm of the service is an integral part, and in tactics that arm in most cases has its distinct part to perform. Etymologically a cavalryman is a horseman. A cavalryman cannot be mounted on a motorcycle, a bicycle, a diminutive automobile, or any gasoline-run machine. His place is on a horse. What is the use of talking differently? Every military person knows that a military machine—an army—

working in Mexico or any embattling country, through roadless regions, must have horses and must have horsemen. The horse and the rider—the cavalryman—is a permanent part of the army. That is the first point.

And the second point is like unto it. The editor of the *Army and Navy Journal*, like many another writer, speaks of the horse as "man's best friend." That is a pretty piece of sentiment which has the virtue of being true. But just as it is true that throughout all civilized ages, in all civilized warfare, it has been found true that the horse is the military man's best friend, so it is also true that the best friend the horse has is the veterinarian. The two, the cavalry horse and the modern army veterinarian, are inseparable—as much so as David and Jonathan or Damon and Pythias. If the horse is a permanent element in the army, as the *Army and Navy Journal* must admit, so also the veterinarian must be a permanent element in the army. With the improvement of the army horse should go the improvement of the army veterinarian. With the increase in number of army horses in case of war with Mexico or any other country, must come the increase in number of army veterinarians. If there are to be improvements in the cavalry arm of the service there should also be an improvement of the efficiency of the best friend of the army horse. If the army horse is to be increasingly more valuable; if he is to be better bred, better trained, better cared for, the professional men who are placed in the army to make him give better service should surely be rewarded. The army cannot separate itself from either—from the military man's best friend or from the best friend of this dumb servitor. Let the army look to it that both are taken at their full value.

D. ARTHUR HUGHES,
Veterinarian, Quartermaster Corps.

HOG CHOLERA AND ITS PREVENTION is the title of *Bulletin* 57, College Station, Texas, by R. P. Marsteller, Associate Professor of Veterinary Science, and is very interesting and instructive; covering the use and method of administering serum, dosage, control and eradication of an outbreak of hog cholera, forms of syringes, etc., etc.

[*Erratum.*] In President Marshall's notice in regard to the meeting of the International Veterinary Congress in London, on page 74 of the October issue, with the recent A. V. M. A. meeting in mind, he announced the *Fiftieth* instead of *Tenth* Veterinary Congress.

SOCIETY MEETINGS.

AMERICAN VETERINARY MEDICAL ASSOCIATION.*

Report of Committee on Resolutions.

Whereas, The control of hog cholera is of the greatest importance to the hog-raising industry of the country, therefore be it

Resolved, That the Committee on Diseases be requested to investigate and present a special report at the next meeting of the Association, on the control and eradication of hog cholera.

Whereas, The published average normal temperatures of the domesticated animals as well as wild animals in confinement, are conflicting and lack uniformity, be it

Resolved, That a request be made to the Federal Bureau of Animal Industry to furnish this Association, at its next meeting, statistics on the normal temperatures of the different domestic animals which come within the scope of their work.

Resolved, That this Association endorse the recommendations of the New York Milk Commission as published by the United States Public Health Service, Volume XXVIII., No. 34, August 22, 1913, with the exception that we do not consider it advisable at this time to recognize any particular score card.

Whereas, The veterinary profession has been assailed and criticized because of some of its members having falsified tuberculin and mallein test-charts, and others issuing certificates for emigrant shipments that were not in conformity with the laws or regulations of the state or province to which such shipment, or shipments, was destined, thereby causing the shipper more

* Space would not permit of the publication of the report of the Committee on Resolutions in the October number; all of which were passed by a vote of the association at the fiftieth anniversary meeting in New York, September, 1913.

or less inconvenience and expense and casting reflection upon the profession as a whole, therefore be it

Resolved, That this Association condemn such action; and be it further

Resolved, That this Association urge that each state or province that has not already done so, enact, at an early date, legislation forbidding the falsifying of any tuberculin or mallein test-chart, or issuing a certificate upon the health of any live-stock shipment, that does not conform to the law of the state or province to which such shipment is destined; and be it further

Resolved, That a copy of this resolution be sent to the governor and live stock sanitary board, or commission, of each state and province of North America.

Resolved, That the recommendations contained in the attached Memorial from the United States Live Stock Sanitary Association, through its Secretary, Prof. J. J. Ferguson, be endorsed by this Association.

MEMORIAL.

To the Members of the American Veterinary Medical Association in Convention Assembled:

GENTLEMEN—As the result of much study and observation in connection with the slaughter of large numbers of hogs at packing houses under United States Government inspection, we deem the following observations of timely importance to the members of your Association and of even greater interest to the farmers and stockmen whom you serve:

We recognize the Niles-Dorset Serum for the treatment of hog cholera as the most valuable agent now employed for this purpose. We recognize that in the hands of competent veterinarians, this serum may be safely administered and prove of great value. We also believe that in the hands of the average farmer and unskilled operator, the use of this serum may cause serious damage to portions of hog carcasses. We believe that improper serum, the use of dirty syringes, accompanied by general unsanitary conditions after treatment, will result in serious damage.

As the proper area for inoculation is still an open question, we wish to suggest that some place other than the ham be properly designated as suitable for the purpose. There is a probability of ham inoculation causing abscesses not discoverable until the ham is sliced for use.

So serious has the situation become that one packing firm has undertaken a series of comparative experiments, in which groups of live hogs are being vaccinated in the neck, shoulder, flank and ham. These groups will be kept separate, slaughtered separately and injury to the carcasses carefully compared by United States Government Inspectors.

We wish to bring this matter strongly before the attention of the American Veterinary Medical Association, with a recommendation that the matter be investigated, and, if possible, some action taken to check this preventible damage.

In our opinion serum should be used only by competent practicing veterinarians. The use of serum by farmers and incompetent laymen should be discouraged as far as possible.

Respectfully yours,
(Signed) J. J. FERGUSON.

Resolved, That this Association desires to express its sincerest thanks to the distinguished gentlemen who were our guests on this occasion, and added so much to our pleasure and entertainment.

Whereas, The success of our annual meetings is, in a large measure, dependent upon the labors of the local Committees on Arrangement and Entertainment; and

Whereas, The splendid success of our Fiftieth Anniversary Meeting reflects the greatest credit upon the members of the local committees, including the ladies; therefore be it

Resolved, That the best thanks of this Association be tendered to each and all of those who have in any way contributed locally or otherwise to the magnificent success of this meeting; and be it further

Resolved, That the Association desires to extend its thanks to all those who have aided in the literary success of our programme.

Respectfully submitted,

W. H. DALRYMPLE, Chairman;
E. H. SHEPARD,
G. A. JOHNSON,
S. H. WARD,
G. B. MCKILLIP.

Resolved, That the European Study Tour for Veterinarians, planned by Dr. A. Eichhorn for American veterinarians in con-

nection with their attendance at the International Veterinary Congress, be endorsed by this Association and that members be recommended to make this tour if practicable for the purpose of study and improvement.

(Signed) D. M. CAMPBELL.

Whereas, It is the constant purpose of the American Veterinary Medical Association to imbue its members with the highest ideals of professional progress; and

Whereas, In pursuance of this policy it desires, wherever the achievements of its members merit it, to commend and give impetus to any measure devised for the furtherance of efficiency of veterinary medicine; and

Whereas, The agricultural departments of the Federal Government and of the several states of the South have, through their cordial and effective co-operation, made notable progress in the eradication of the cattle tick (*Margaropus annulatus*); and

Whereas, The eradication of the cattle tick from the Southern States of America is of national importance, involving the development of the cattle industry of more than seven hundred thousand square miles of territory; and

Whereas, The area now quarantined because of the tick, when free, will produce thirty millions more cattle, worth nearly one billion dollars; and

Whereas, The early termination of this work requires the discontinuance of the practice of shipping cattle infested with ticks from the quarantine area to free market points for immediate slaughter; and

Whereas, It is the judgment of this Association that splenetic fever or "tick fever" should be subjected to the same restraints as is tuberculosis, glanders, hog cholera and other contagious, infectious and communicable diseases; therefore be it

Resolved, That the Association congratulates Drs. Curtice, Butler, Mohler, Dalrymple, and all others who have participated in the stupendous sanitary work thus far accomplished through tick eradication; and be it further

Resolved, That this Association record itself in favor of an amendment to the Act of Congress dated 1884, which will prevent the interstate movement of cattle for any purpose whatsoever, when infested with cattle ticks; and be it further

Resolved, That a copy of these resolutions be forwarded to the Honorable Secretary of Agriculture of the Federal Govern-

ment and to the Federal Government and to the Governors of the several Southern States and to the Chairman of the Committee on Agriculture of each House of Congress.

W. H. DALRYMPLE, Chairman.

COMMITTEES APPOINTED BY PRESIDENT MARSHALL FOR 1913-1914.

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Reorganization of Association.

H. D. Gill, Chairman

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Washington—J. T. Seeley, Seattle.
West Virginia—L. N. Reefer, Wheeling.
Wisconsin—W. G. Clark, Marinette.
Wyoming—Otto L. Prien, Laramie.

Australia.

Australia—J. Desmond, Adelaide, New South Wales.

South America.

Brazil—John H. McNeil, Sao Paulo.

Canada.

Alberta—Edward A. Watson, Lethbridge.
British Columbia—Seymour Hadwen, Agassiz.
Manitoba—R. D. Macintosh, Winnipeg.
New Brunswick—D. McCuaig, McAdam Junction.
Nova Scotia—William Jakeman, Glace Bay.
Ontario—D. McAlpine, Brockville.
Prince Edward Island—W. H. Pethick, Charlottetown.
Quebec—A. A. Etienne, Montreal.
Saskatchewan—D. S. Tamblyn, Regina.

NEW YORK STATE VETERINARY MEDICAL SOCIETY.

The above society held its annual meeting on board the steamer *Rosedale* while cruising in the waters of the Hudson River and New York Bay September 4, 1913. After a business session, reading of secretary's report and admission of new members, the president, Dr. David W. Cochran, read the annual presidential address.

President Cochran's Address.

Gentlemen—In keeping with the time-honored custom of this society, we are gathered here to-day to strike a trial balance of our activities during the past year. But before I proceed further I wish to thank you, one and all, for the support I have had during my term of office. It is the purpose of every man's life to do something worthy of the recognition and appreciation of his fellow man. There is no accomplishment of mine of sufficient importance to have accorded me the honor which you have conferred on me in electing me President of the New York State Veterinary Medical Society. For your generosity in thus honoring me, I am most grateful. The span of man's activity is so short that many who are most worthy cannot receive the honor. That you should have conferred it on me affects me profoundly. In return for your confidence it has been my pleasure to give my best energy, thought and judgment to the welfare of this society. Good fellowship is an asset. It is an educator. I am grateful to all—each and every one—and gratitude with me is the fairest flower that sheds its perfume in the human heart. The wisest of ancients declared that a man was rich beyond the dreams of avarice if he could count, in fortune and misfortune, his true friends on the fingers of one hand. You are all my friends. I know whereof I speak, for I have tested your friendship many times, in sunshine and in storm. According to the wisdom of the old philosopher, I am indeed rich—not in dollars, but something better, something dollars cannot buy—true, sincere friends, with whom I have been acquainted for a long time. My life has been a simple one, an earnest one. I believe the secret of all success is hard work, loyalty to friends and fidelity to my profession.

Twenty-four years ago there was held a conference of a number of veterinarians. For the time being they buried their prejudices and fears of one another. They discovered that when

men come together and look into each others' faces and laugh and joke, they become closely bound together by ties of friendship; that when men are in the same business, there is that which they hold in common that makes for respect and confidence; and especially, that after intimate association they cannot be guilty of any lies or misrepresentations or defamations concerning their associates.

A convention such as this has many pleasant associations and beneficial influences. It cultivates a spirit of fraternity and good fellowship. We come together to consider matters affecting the welfare and progress of our profession. This association has been a strong factor in bringing together the best element of the veterinary profession. The papers, reports of cases and discussions at these meetings have been instructive and of scientific and practical value. Should our ideas not meet with approval and our will be defeated, let us accept the result cheerfully as the will of the majority, and try again. Remember that the age in which we live is one of organization. No longer do men attempt to stand alone when seeking to accomplish the best results, or to protect themselves against persistent wrongdoers; but by combining forces, become a power for good. If, therefore, we hope to perpetuate the noble efforts of our society, we must submerge all differences, unite our forces and work for the common welfare of all. One may argue that it matters very little whether he adds his strength to the organization or not, it will go along just the same. But let us remember the lesson given by the wise father to his sons. The bundle of sticks, bound together, resists all efforts to break them. Disjoined and disunited, they may be broken one by one with the greatest ease. Thus it is with us; joined together by the indossoluble ties of brotherhood and common interests, we are indestructible. Separate and apart, we may be broken on the rock of prejudice and the results of our labors dissipated. Let those who are wavering take the lesson well to heart and cast their lot with those who are working for the glory and perpetuation of our profession.

The uneducated empiric has been driven out to a great extent to make way for the veterinarian who is educated in our up-to-date institutions. Charlatanry seems to be an immortal fungus which clings to every phase of civilization and to no phase more tenaciously than to that which embraces the physical ills of our patients. Though no doubt honest art will prevail in the end, yet the competition of the charlatan makes itself felt and will continue to do so until the public realizes how uneconomic it is

to fool with disease. The increasing number and value of live stock demands of us and offers due reward to us for higher knowledge and skill in the treatment of their diseases. The veterinary profession can do a great public good by giving information as to the diseases of animals. Ignorance and erroneous views often exist, and the danger of contagious diseases is not generally understood by many people with whom we come in daily contact.

The different veterinary bureaus are equipped with able veterinarians who are competent to handle the problems which they meet in their daily routine work. The veterinarian should be practical, not too theoretical. He should endeavor to adapt scientific theory to practical conditions. I would caution those who are acting in an official capacity to be reasonable in their advice, not too authoritative, so as not to create any antgonism or irritation on the part of the stock owners or keepers of live stock. We should endeavor to obtain their co-operation.

The veterinarian of the present time occupies an important position as guardian of the health of the public. It is a well-known fact that meat and milk are sold in our large cities that are unfit for human food, that endanger the health and even the life of the consumer. The veterinarian can render valuable service by condemning for consumption unhealthy animal food, as well as preventing the transmission of animal diseases to man, and controlling and extirpating contagious diseases of animals.

The training given by our colleges is of the highest value for young men who choose the veterinary profession. The most successful are those who have a love for animals and have had experience in handling live stock. Advancement is retarded by the failure of the individual to utilize time and avail himself of opportunity. The demand of the times is that we level every opposition and make smooth the way of general progress, enlightenment, education and the higher ethical obligations. Competency is attained and maintained only by indefatigable labor and continued effort in self-education. The responsibilities of the veterinarian rests upon his own individual self for his position, and to a limited, but positive degree, for that of his fellow practitioners. If he shrinks from its weight, the burden becomes doubly heavy. If he " short cuts " for success, he sinks into the mire of dishonesty and dishonor. If he carries the weight with an erect figure, abiding integrity and a strong heart, it rides like a bubble. When given a diploma, we are all supposed to be equal. But no insignia makes men equal in veterinary

medicine any more than in other lines of human endeavor. Every individual has a personality of his own. By his superior intellectual qualifications, his fidelity of purpose, and, above all, his indefatigable labor, he may become a leader. He who keeps above the standard desires companionship. Therefore if we elevate the ethical and educational average, we enhance the percentage of efficiency to the public and increase the brotherhood of the profession. The ideal of practice must be the stimulation of individual exertion to the highest degree and the establishment of a standard, the attainment of which should be the great desire of every member of our society, each to assist the other in his upward progress. The vast majority of veterinarians are men of high integrity and are a credit to the profession. In every profession, however, some unworthy members are to be found. Ours is no exception.

The successful veterinarian is a deep thinker, an investigator. Our patients cannot tell us their sensations, nor history of any injuries. We must know from clinical experience to become experts in the art of interpreting the different forms the patient assumes: note the characteristic gait, any alteration in the function of respiration as characterized by an increased dilation of the nostrils; peculiar forms of coughing; accelerated motion in the region of the flanks; any changes in the circulation as indicated by the pulse; the appearance of the mucous membranes; the condition of the nerve centres by the more or less diminution of strength of the animal; the febrile condition by the registered heat of the thermometer; as well as the slightest departure from any normal condition. It is an art of close observation. While we of the present day owe much to the bacteriologist in clearing up some of the latent forms of disease, still the bacteriologist has to depend on the clinician to discover first the various pathological lesions. The relations between the clinician and biologist must be reciprocal. The former has spent centuries in acquiring knowledge which the latter is perfecting. The latter is working out exact methods, whose application must in the future perfect the work of the former. Neither can satisfactorily perform the work of the other; neither can do the work of both for the fields are too large.

War has had its heroes and its victories. Slowly and surely they are fading into the region of the legend and of history. But the courage and strength, the nobility and gallantry that the race has evolved through centuries of struggle, have been turned toward another goal—more useful to mankind. Those of the army of thinkers are truly the soldiers of their country. They

who stand, hour after hour, over their test tubes in the laboratory are the modern heroes, the leaders and the warriors of to-day in their effort to further advance human knowledge beyond which lie the clouds of mystery encircling our little corner of the universe. Investigation becomes synonymous with painstaking, inquisitive, unwearying, intellectual toil. We have here with us men of tried calibre, whose education and the effort which they are putting forth are national property.

We are members of a great profession, left to us in all its beauty and dignity as the result of the self-sacrificing efforts and loyalty of those who have gone before. We have received this priceless heritage, and it is ours to pass on unsullied and untarnished to our successors. Our predecessors built the foundation. Let us add our mite to the building of a glorious and perfected superstructure. Well has the poet sung:

Not gold, but only men can make
A nation great and strong,
Men who for truth and justice' sake
Stand fast and suffer long,
Brave men who work while others sleep,
Who stand when others fly—
They plant the nation's pillars deep
And raise them to the sky.

Scientific Progress—While there has been no epoch-making discovery since our last meeting, great practical advancement has been made. The different modus operandi for the diagnosis of glanders have greatly advanced, though they have not been entirely mastered. The efficiency of the tubercular testing in cattle has been thoroughly demonstrated by positive post-mortem examinations. The immunizing of hogs with serum for hog cholera has proven very effiective.

Immunity from Disease—As far as the treatment of disease is concerned, I think drugs will be given more, but also more wisely; or rather, what we administer will be increasingly in sera-therapy or chemo-therapy to confer immunity from disease. But our great aim will be in the direction of hygiene, the science of preserving health, the science of curing disease, for hygiene is the finest jewel in the medical crown. The name of every prominent man in medicine has been associated with some achievement in connection with the prevention of disease as well as its cure. Remember it is easier to preserve the health of animals than it is to restore it when lost.

I am in favor of abolishing the public watering trough. I do not think there is any debate, but this is one of the possibilities of spreading glanders. I would also recommend public abattoirs that would be under competent veterinary inspection. In this way, meat which would be dangerous to health would be condemned and the owner could receive a part indemnity.

I want especially, gentlemen, to call your attention to one fact which I think a great many members have overlooked—that is the conference which is held at Ithaca each year. It should receive the earnest co-operation of every veterinarian in this state. I can assure you, from personal experience, that it is time and money well spent. It has not been appreciated by the veterinarians of the state as it should be. The endeavor put forth, and the energy expended by the men who originated the idea of this conference, should be more appreciated than it has been. I consider it one of the most interesting meetings of veterinarians I have the pleasure to attend. The clinics are most attractive, instructive, and inspiring, and I consider them the best means of advancing, co-ordinating and standardizing medical innovation. We have a striking example of the enthusiasm, appreciation and desire for these meetings by the ever-increasing attendance of busy practitioners. Men are inspired by seeing others in action rather than by reading or hearing about them. The clinics are all diseases of the everyday type, accentuating the most recent advancement in diagnoses and treatment. These clinics increase the interest and enhance the educational value of these conferences.

In the State of New York there are seven veterinary societies (one I have just alluded to). The work accomplished at the conventions of these societies is of great educational value, for here are brought together men with one desire uppermost in their minds—the elevation of the veterinary profession. The papers read at these meetings with the discussions ensuing, the observations and experiences of members, the interchange of ideas, the successes and failures met with in practice, all these things come as the result of organization, and tend to uplift the profession and enhance the veterinarian's proficiency. One of the greatest benefits to our profession is the work done by a special committee, appointed in the societies, in exterminating from the field of practice illegal practitioners. Their untiring labor, the sacrifice of their time and expense, and the results obtained by them, cannot but be appreciated by all who have at heart the uplift of the profession. Certainly these men should receive the support and credit due to their indefatigable labors.

We have two veterinary colleges in the State of New York, both under government support. The entrance requirements of these institutions are such that graduates from them will be the standards of the country. When all states or colleges in the United States have adopted a uniform college entrance examination, then a graduate from a college in one state of the Union will be on an equal footing with a graduate from any other state. Then, and only then, can we have an interstate license; a man who has passed the state examination in one place would be eligible to practice in any other provided the standards of examination would be equal to those of New York State.

The twenty-fourth annual meeting of the New York State Veterinary Medical Society will be a meeting only in name, and the business conducted will be only routine work. While the individuality and pleasure and educational advantages of our meeting have been absorbed by the convention of the fiftieth annual celebration of the American Veterinary Medical Association in our state, it was deemed imprudent to hold two large meetings in the state close to each other, for the expense and time lost to the members would be considerable. Precedence was given to the A. V. M. A. The majority of the members sanctioned that we gracefully and cheerfully unite with the A. V. M. A. to celebrate the great event in veterinary history. It is to be hoped that next year, when this society holds its twenty-fifth annual meeting, the celebration of that august event will be of as much importance as the present meeting of the A. V. M. A. What the one will lack in number, will be made up in enthusiastic show of dash and spirit, which is a complementary part of every gathering of veterinarians.

Dr. Cochran's address was followed by the election of officers for 1914, making Dr. W. B. Switzer, of Oswego, its chief executive, and continuing Dr. H. J. Milks, of Ithaca, as secretary. The meeting then adjourned, to meet in Rochester in 1914 to celebrate its silver anniversary in the city in which it was organized in 1889.

MAINE VETERINARY MEDICAL ASSOCIATION.

The quarterly meeting of the M. V. M. A. was called to order by the president, Dr. Jervis, at Waterville, October 8, 1913.

The following responded to the roll-call: Drs. L. S. Cleaves, W. H. Corey, C. F. Dwinal, H. N. Eames, F. W. Huntington,

G. R. Inglis, H. B. F. Jervis, A. Joly, W. H. Lynch, C. H. McGillicuddy, C. W. Purcell, E. E. Russell, F. L. Russell, I. L. Salley, C. L. Ryan, H. L. Stevens, W. H. Robinson, G. F. Wescott, H. B. Wescott, W. L. West.

Dr. D. B. Fitzpatrick, of Philadelphia, Pa., and Dr. Carl F. Davis, of Rumford Falls, Me., were welcome visitors.

The minutes of the July meeting were read and accepted.

Dr. W. L. West read Dr. C. L. Blakely's paper on "A Peculiar Case in a Horse." The paper described the symptoms found and the treatment used, and was discussed very freely. A letter from Dr. Blakely was read, explaining why he was unable to be present and read his own paper.

Dr. H. N. Eames read a paper on "Contagious Abortion," which brought forth a very interesting and heated discussion.

Dr. Jervis next introduced Dr. D. B. Fitzpatrick, Deputy State Veterinarian of Pennsylvania, as the speaker of the evening. Dr. Fitzpatrick's address was on "The Production of Wholesome Milk." He outlined the laws in force in Pennsylvania in regard to the milk supply and its inspection. He illustrated his address by the use of slides and a lantern, which proved to be very interesting and instructive. At the conclusion of his address the association extended him a rising vote of thanks.

A vote of thanks was extended to the Waterville city government for the courtesy shown the association by extending the use of the aldermanic chambers for the meeting.

The following members reported as attending the A. V. M. A.: Drs. W. L. Mebane, A. Joly, G. F. Wescott, A. L. Murch, W. H. Robinson, W. H. Lynch. Dr. Lynch read a report of the meeting of the Boards of Examiners of the several states.

The committee on the revision of the schedule of fees asked to have more time to prepare their report and will present the same at the January meeting.

The application of Dr. Carl F. Davis, of Rumford Falls, Me., was acted favorably upon by the executive committee, and he was then elected to membership.

The secretary reported the receipt of the annual reports of the proceedings of the Pennsylvania and Indiana State Veterinary Medical Associations.

Dr. Herbert F. Palmer, of Philadelphia; Dr. D. B. Fitzpatrick, of Philadelphia, and Dr. Wm. M. Simpson, of Malden, Mass., were elected honorary members of the association.

It was voted to hold the annual meeting in Portland, January 14, 1914. It was also voted to give the ladies a banquet, and the president appointed the Portland members on this committee

to make arrangements for the banquet and the entertainment for the ladies in the afternoon. The meeting will be called at 3 p. m., and the banquet will be held at 7 p. m.

Banquet committee: Dr. W. H. Robinson, chairman; Drs. W. H. Spear, F. W. Huntington, W. H. Lynch, G. F. Wescott, H. B. Wescott.

Meeting adjourned at 12.45 a. m.

H. B. WESCOTT, Secretary.

KEYSTONE VETERINARY MEDICAL ASSOCIATION.

The first regular meeting of the 1913-1914 session of the K. V. M. A. was held September 9, 1913; President Yunker in the chair.

The meeting was opened with the calling of the roll, twenty-three members responding to their names; and as guests, Doctors Mumma, Gunner and Crocket were present.

The first essayist was Dr. Louis A. Klein, who read a very interesting paper on "Therapeutics of Mastitis in Cattle," in which he outlined the treatment advocated by various veterinarians, calling particular attention to the use of purgatives, potassium iodide and the use of biological products.

The next essayist was Dr. John Reichel, who read a paper on "Diagnosis of Glanders" which was similar to the report of the Glander's Commission of the American Veterinary Medical Association, of which he is a member. This report was received with the greatest interest and the Association voted its hearty approval of the same.

The reading of the papers was followed by the report of the delegates to American Veterinary Medical Association. Doctors F. H. Schneider and L. A. Klein spoke briefly, followed by a very entertaining description by Dr. W. H. Hoskins.

The applications of Doctors James B. Hardenberg, J. Julius Herbott and Charles MacAnulty were favorably recommended by the Board of Censors, and were elected to active membership.

The annual election of officers resulted as follows: Dr. Elkan H. Yunker, President; Dr. Mayhar W. Drake, Vice-President; Dr. Cheston M. Hoskins, Secretary and Treasurer; Board of Censors, Doctors W. H. Hoskins, C. J. Marshall, A. Ormiston, F. H. Schneider and J. Reichel.

There being no further business a motion to adjourn was made, seconded and passed.

CHESTON M. HOSKINS, Secretary.

NEWS AND ITEMS.

VETERINARIAN OLAF SCHWARZKOPF, THIRD CAVALRY, U. S. ARMY, has gone from Fort Sam Houston, San Antonio, Texas, to Fort Riley, Kansas, as instructor in the Mounted Service School.

UNITED STATES LIVE STOCK SANITARY ASSOCIATION.—The Seventeenth Annual Meeting of the U. S. Live Stock Sanitary Association will be held in Chicago, at Hotel Sherman, December 2, 3 and 4, 1913.

THE TEXAS VETERINARY MEDICAL ASSOCIATION.—The semi-annual meeting of the Texas Veterinary Medical Association will be held at College Station November 18-19. Headquarters at the Veterinary building.

UTAH VETERINARY MEDICAL ASSOCIATION.—Through the courtesy of Secretary Coburn of the above association we received a report of the fourth annual meeting of this organization at Salt Lake City, on October 4, 1913. We regret its receipt too late for the November issue, but will take care of it in the next number.

OPENING EXERCISES, ONTARIO VETERINARY COLLEGE.—The opening exercises of the Ontario Veterinary College occurred on October 2, 1913. Addresses were delivered by the Venerable Archdeacon Cody, M.A., L.L.D., D.D., member of the Royal Commission of Higher Education in the Province of Ontario; and Robert A. Falconer, C.M.G., M.A., L.L.D., President, University of Toronto.

APPOINTED.—Dr. John T. E. Dinwoodie, of Bottineau, N. D., a graduate of the University of Pennsylvania Veterinary Department, has been added to the staff of the Veterinary Division of the College of Agriculture of the University of Minnesota. Dr. C. C. Palmer, of Pleasant Hill, Ohio, a graduate of the College of Veterinary Medicine of Ohio State University, has also been elected to a place in the same Division. He succeeds Dr. C. C. Lipp, who recently resigned to accept a professorship in the College of Agriculture of South Dakota, at Brookings.

NEW YORK UNIVERSITY DAY.—On October 17, all schools of New York University suspended sessions from 1 to 7 p. m. in order that all its students might assemble on the campus at University Heights, where the students from each school, with

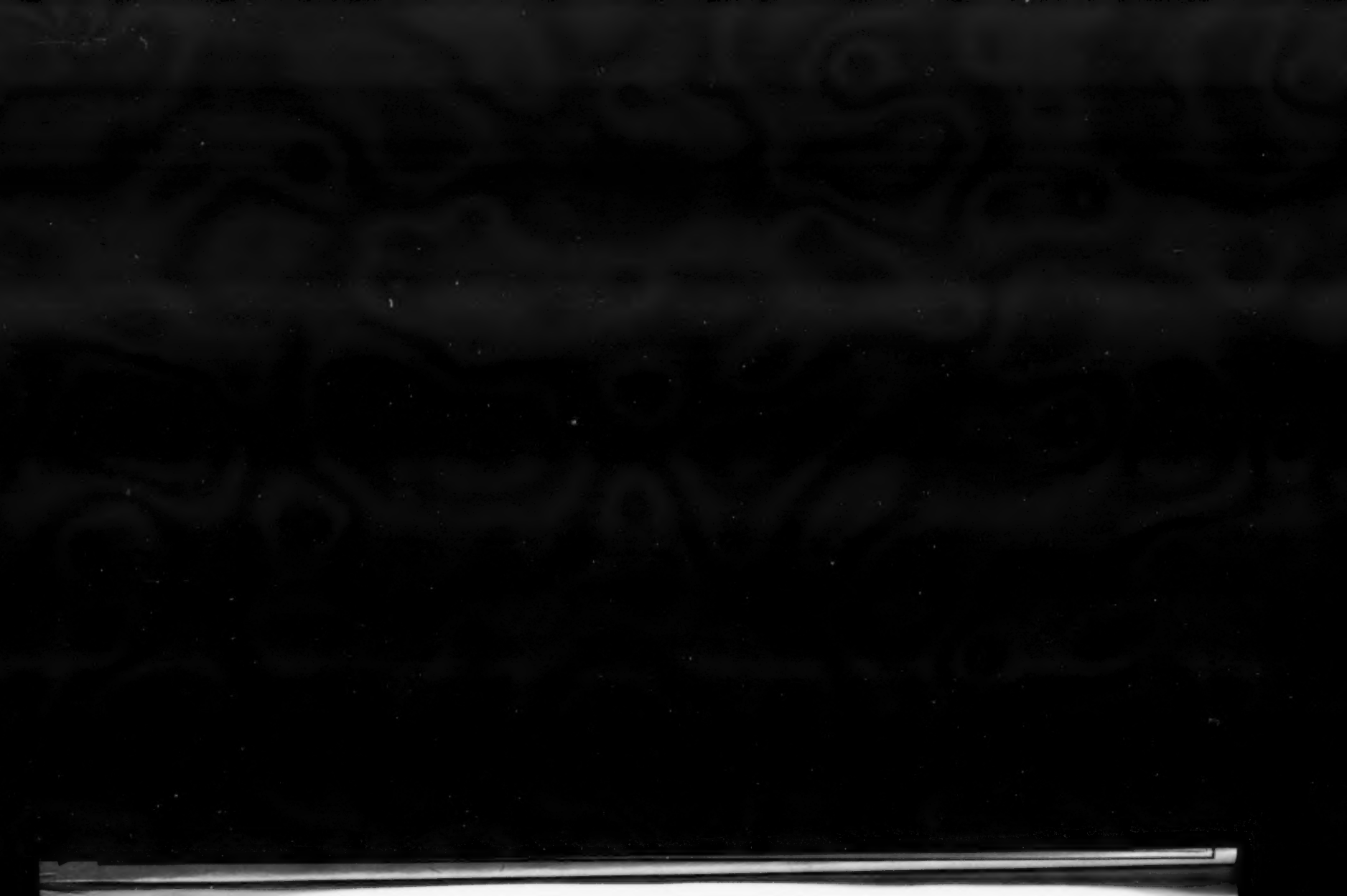
their colors in the form of a band about the arm, met their respective deans, afterward greeted the Chancellor on the Library steps, and finally reported to their school marshals and formed a procession that walked about the beautiful grounds. The weather was ideal and the occasion a particularly enjoyable one.

ALPHA PSI NEWS: MARRIED.—St. Paul, Minn., October 14, 1913, Dr. Arnold A. Feist to Miss Victoria H. Taylor, of Philadelphia, Pa. Dr. Feist is a graduate of the Veterinary Department of the University of Pennsylvania, and was Resident Surgeon at the Veterinary Hospital, 1912-1913. Dr. Feist is a member of the Alpha Psi Fraternity and the American Veterinary Medical Association.

DIED.—August 7, 1913, Dr. Walter McHenry, of Waverly, Iowa. Dr. McHenry was a graduate of the Veterinary Department of the University of Pennsylvania, class of 1908. After graduation Dr. McHenry was appointed to the teaching staff of the New York State Veterinary College, at Cornell. More recently he was engaged in lecture work for the Bureau of Animal Industry at Washington. Dr. McHenry was a member of the Alpha Psi Fraternity and the American Veterinary Medical Association.

UNITED STATES CIVIL SERVICE EXAMINATION—VETERINARIAN (MALE).—The United States Civil Service Commission announces an open competitive examination for veterinarian, for men only, on December 3, 1913, to fill vacancies in the position of veterinary inspector in the Bureau of Animal Industry, Department of Agriculture, and vacancies in the Quartermaster Corps, at entrance salaries ranging from $1,200 to $1,400 per annum. Competitors will be examined in the following subjects, which will have the relative weights indicated: 1. Letter writing, 10; 2. Veterinary anatomy and physiology, 20; 3. Veterinary pathology and meat inspection, 30; 4. Theory and practice of veterinary medicine, 30; 5. Education, training and experience, 10; total, 100.

Graduation from an accredited veterinary college is a prerequisite for consideration for this position. Applicants must have reached their twenty-first birth-day on the date of the examination. This examination is open to all men who are citizens of or owe allegiance to the United States and who meet the requirements.

Persons who meet the requirements and desire this examination should at once apply to the United States Civil Service Commission, Washington, D. C.

THE SOUTH AMERICAN MEAT INDUSTRY.—Under the above caption the Office of Information, U. S. Department of Agriculture presents to the public the findings of Dr. A. D. Melvin, Chief of the Bureau of Animal Industry, who has recently returned from a tour of investigation, made by direction of the Secretary of Agriculture, through Argentina, Uruguay and Brazil. In Argentina he visited all the establishments preparing beef for export, except one, which was not in operation at the time. He also visited several large ranches, and attended the stock shows at Rosario and Palmero, where many fine animals were exhibited. In Uruguay he visited one of the two large establishments, the other not being in operation. In Brazil he visited Sao Paulo and Rio de Janeiro, where a fine municipal abattoir has recently been completed. From this point he went into the interior of the country. Argentina and Uruguay are large exporters of beef and mutton, for which Great Britain is their principal market. Brazil exports no refrigerated beef, although it supplies Central America and Cuba with a considerable quantity of cured beef, known as *taajyo* or *jerked beef*. Dr. Melvin was impressed with the great resources of that country for cattle raising, and believes it would be possible to largely increase the meat output. The doctor states that the cattle (for the most part high-grade stock, Durhams leading, Herefords ranking second and Polled Angus third), are raised and fattened entirely on alfalfa pastures, getting no grain whatever; these pastures supporting the cattle the year round. And yet, he says, alfalfa is not being grown nearly as extensively as it could be. Cattle that dressed 820 pounds were being sold for $74.80 in gold; this being a very high-grade beef that sells in England for from 8 to 9 cents a pound wholesale. A very high grade of mutton is also produced in the Argentine; the best breeds of cattle and sheep having been imported there for years from Great Britain. Uruguay has a good grade of live stock, but they are not equal to the cattle in the alfalfa region of Argentina. Dr. Melvin reports that the federal governments of both Argentina and Uruguay, maintain veterinary inspection at all of the establishments exporting fresh beef; and that municipal abattoirs with official inspection are maintained very generally at all the South American cities of any importance. The cattle of Brazil are not of such good quality as those of Argentina and Uruguay; being largely mixed with the Zebu or East Indian cattle, a group of which were shown in the April, 1913, issue of the REVIEW on page 121, under "Tidings from Brazil."